

# **Guidelines Concerning Master's Thesis „Management and Production Engineering” at the Institute of Organization of Production Systems**

The supplement to *Principles of a master thesis and defend at the Faculty of Production Engineering* confirmed by the *Faculty of Production Engineering* with the Resolution No. 60 on 26.03.2013

## **1. General Directives**

*The qualifying master's engineering thesis* should be an independent solution of the organizational and technical problem of an engineering project character or an experiment to show the engineering knowledge in the field of the study.

*The qualifying master's thesis* in technical studies should be an independent solution (the student's own) of the organizational and technical problem of engineering feature – conceptual, project, theoretical or experimental, to demonstrate engineering and managerial knowledge in the field of the study.

## **2. Aims of Writing**

The aim of writing master's thesis is to teach students how to write a coherent and comprehensive written report on a concrete subject. Writing the thesis is a test of utilization of knowledge, skills, and competencies acquired in time of studies to independently solve a problem, such as: the skill of distinguishing the indispensable tasks to realizing the aim of work (the formulated problem), the analysis and the utilization of literature on a given topic, the selection of research methods and/or project methods, the planning of research (the experiment), the preparation, verification and the interpretation of results, formulating the conclusions and articulating the considerations, editing a written report.

## **3. Topics**

The topics should be related with the research activities of the Faculty/the Institute, and preferably be realized in co-operation with industrial companies.

*The engineering master's thesis* should concern economic and organizational problems connected with the realization of processes of management and the utilization of technical devices, processes of development of new products and technological processes, materials or software.

*The master's thesis* should demonstrate the skills of using research methods as well as skills of defining and solving problems connected with the direction of studies and the specialty.

When formulating the subject matter of the thesis the following elements are taken into account:

- works led by the Faculty/the Institute, commissioned by industry, statutory investigations, grants etc.
- international co-operation,
- the proposals of subjects from representatives of industry and employers,
- the connection of internship with subject of a thesis,
- student's interest, her/his initiative and activity.

The final title is a result of agreement between the thesis tutor (a student supervisor) and the student. It is expected that the student should have own initiative both in choosing an advisor as well in the title and content of work.

#### 4. Object of a Thesis

The solution of tasks in *engineering master's thesis* can be related to:

- technological process,
- production and characterizing the applied material in manufacturing,
- production and characterizing equipment or machinery,
- realization of a software development project,
- rationalization of processes,
- management of organizations,
- organizational changes.

*Engineering master's thesis* can be:

- an independent study of a problem, based on analysis and empirical data (e.g. from an enterprise) or from literature,
- the solution of a task in the range of the analysis, design and the economic assessment of solutions of technical and organizational problems relating to the production or the exploitation of technical equipment and the objects, design, exploitation (management), modernization (restructuring, changes) of enterprises or their subsystems.
- a solution of a problem within the range of organization, management and economics of production and the services, as well as functioning of the organization or its subsystems that run such an activity.

*The master's thesis* in "Management and Production Engineering" should concern parts or the whole process and objects of organizational and technical characters (systems of management, production systems or information systems).

It is advisable to realize the undertaking in co-operation with organizations of various types: manufacturers, service providers, financial institutions, or public institutions. The realization should be proceeded and connected with internship in an industrial firm or different organization, whose core activities are closely related to the thesis scope. A given task should have practical project approach .

The subject of master's thesis should be connected with Management and Production Engineering.

The object of the *master's thesis* in Management and Engineering of Production can be in particular:

- the realization of a research task,
- the solution of a computational, project, technological tasks or dealing with a part of a larger project but with organizational and economic aspects undertaken.
- study or essential improvement of an investigative, measuring, analytical, project method as well as its practical verification,
- the realization of a software project,
- the solution of technical and organizational problem.

A thesis can be a part of a larger distinctive project.

A thesis should contain new analyses, experimental or theoretical research, or a new solution to the selected problem within a range of a realized studies program. If it does not have the character of a project, then it should contain a research part.

Executing graduate thesis should be held in industrial enterprises or different organizations as well as it is advised to precede it with an internship. A time scope of internship depends on the substance and topic of a thesis.

## **5. Number of Team Members**

Master's thesis should be realized individually, or in two or three-person teams if the subject demands that. This requires, noteworthy before beginning of writing, detailed qualification of each person's contribution. After completion of an interim project it is necessary to describe clearly individual contributions to each chapter/subchapter which should be subject to final assessment.

## **6. Circulation of Documents Concerning the Choice and Acceptance of the Title of a Thesis**

1. As a result of co-ordination between a student and an advisor/tutor the definite title of thesis is stated. The list of academics entitled to hold the function of tutor is available at the Secretary's Office of the Institute. After the tutor's choice and the title agreement the student prepares the proposal of thesis's structure - the plan of work. A title as well as the structure of thesis should be written by the student on a card of a notification of a title of the thesis (a form FOR - 03). A form signed by a student and an advisor should be brought to the Secretary's Office of the Institute of Organization of Production Systems (ST 148) not later than 4 weeks from the beginning of a semester. The Director of the Institute confirms the title and the structure of work after getting the advisor's opinion. The student can find the information about the decision of the Director of the Institute at the Secretary's Office. In case of a lack of acceptance one should, in agreement with the tutor, implement the remarks and prepare the improved version of a card of title notification.
2. Any change of the earlier accepted title of thesis and/or the advisor is possible only in special and well-founded cases. The student submits an application to the Director for Teaching of the Institute, accepted by the previous and new tutor, and then he/she proceeds with procedure described in 1<sup>st</sup> point.
3. A card of notification of a title is kept at the Secretary's Office. The title page of a thesis is based on the last version of a card of notification.

## **7. Structure of a Thesis**

It should contain the following elements:

- the introduction (explaining the reason of choice of a subject, the main aim of work and alternatively the detailed objectives, main assumptions, scope, a proposed method of a solution of a project problem, the applied research methods),
- the analyses regarding the problematic area (the current state of knowledge on undertaken subject),
- the profile of the unit ( the environment - the place of realization of project),
- the analysis and the diagnosis of current state in problematic area,
- formulation of a project task,
- the solution of a problem - the project of solution within the range of organization, management, economics,
- the evaluation of problem solution and the concept of implementing solution,
- the economic evaluation of a project solution,
- recapitulation and conclusions.

Moreover it should contain:

- the table of content,
- the bibliography (the list of literature, list of internet sites and different sources of information),
- the list of abbreviations, symbols and the signs together with explanations (optional),

- the list of figures,
- the list of graphs,
- the list of attachments,
- summary in Polish at the end.

Students of studies in a foreign language prepare the thesis in the language of their studies.

In case of a thesis written in a foreign language the title and the summary must be in Polish language too.

## **8. Number of Pages**

The engineering master's thesis should contain not less than 80 pages, the master's thesis at least 100 pages.

## **9. Criteria of Evaluation**

The criteria of evaluation of a thesis are the following:

1. Qualification of aim of the thesis, the formulation of the problem, project task, defining the project foundations.
2. Analyses and the diagnosis of current state in the given area, the correctness of selection and the utilization of methodology and the detailed methods.
3. Solution of problem/the study of project, opinion of obtained results. The evaluation of the selected methodology of the problem solution and the way of utilization of detailed methods.
4. Economic evaluation of usage of a project solution.
5. Selection of literature of a topic regarding the utilization and the correctness of citations/quotations.
6. Structure of the thesis.
7. Editing of the thesis (language accuracy, arrangement, editorial part).
8. Extension of knowledge acquired at studies, utilization of new tools.
9. Independence in realization of the thesis.
10. Delivering on time.

The engineering and master's thesis differ with regard to complexity and the scale of study of a subject in a range of the above elements but all of them have to be included in the thesis.

## **10. Internship as Support in Process of Master's Thesis Writing**

The preparation of *master's engineering thesis* is connected with performance in an industrial institution or other organization in a form of the internship where a project will be realized.

The goal of internship is to gather the indispensable materials. For engineering students in Management and Production Engineering the internship is obligatory and precedes the realization of thesis writing.

It is suggested, *that master's thesis* be proceeded with an internship. Its time scope is based on type and topic of a master's thesis.

Formal matters connected with an internship related to a master's thesis are the same as in the case of the internship linked to a master's engineering thesis.