

## ANALYSIS OF MASTER STUDENTS' THESES

### Criteria:

- research-oriented kind of work;
- novelty of researches object;
- presence and level of experiments;
- presence and level of the statistic processing of experimental results;
- application of modern information technologies;
- application of mathematical simulation;
- presence and completeness of patent search;
- use of modern periodicals, scientific and technical literature including foreign sources;
- exploitation of Internet possibilities using for obtain the information;
- quality of research results presentation and discussion;
- accordance of text and graphic presentation to rules;
- presence of publications.

### Estimation

Estimation on accordance to all criteria was made after three point scale:

- 0 - absence or low;
- 1- satisfactory;
- 2 - high.

Results are represented at the diagram on the page 3

82 master theses were analyzed in direction «Metallurgy» on following specialities:

- Ferrous/Non-ferrous metallurgy (32)
- Metal Forming (29)
- Foundry (9)
- Industrial Heating (12).

### Key Findings

1. All works have research-oriented character.
2. In the most of cases modern energy and resource saving technologies of metallurgy and near fields of industry were chosen as the research topics. At the same time, the lot of works (25,6%;) are devoted to perfection of out-of-date technical objects (open hearth furnace, rolling mills and foundry equipment of out-of-dated constructions) as well as to confirmation of well-known results. It partly can be related to not enough accents of teachers on new perspective directions of researches, and also can be connected to low level of equipment and technologies in accessible industrial enterprises.
3. Researches were mainly made in laboratory (76 works). Thus the level of experiments is determined by available laboratory base. The industrial experiments were made in a few of works (6 works) which were executed within the framework of researches works of corresponding departments.
4. Possibilities of mathematical modelling for simulation of investigating object and obtaining of experimental information using a model are not enough widely (22 works) used.

5. Application of statistic methods for processing of the experimental data in the majority of cases is limited with calculation of the expected value, dispersion and correlation factors (60 works). Planning of experiment and analysis of variance regressive are practically absent.
6. Possibilities of information technologies are not enough utilized in most works. Not always (27 works only) students are used the specialized software for research. At the study of technological processes static conditions are used more frequent.
7. State of the art research present at all works. The overall depth of literature search is satisfactory. Nevertheless, frequently, students limited themselves in the analysis of domestic scientific and technical literature (56 works). Apparently, it is related to the low level of foreign languages knowledge. There are works, in which references were absent even to those modern magazines which are present at the NMAU library. Patent materials are not enough analysed, that testifies to insufficient skills of students in area of patenting and intellectual property protection. The cases of Internet information use are extremely rare (4 works).
8. The results of 74% master's degree works are published. In majority of cases (54 works) the publication were made in proceedings of the yearly students conference «Young Academy». The publications in more serious scientific editions are very rare.

**Recommendations:**

1. To promote the requirements to the volume and content of practical work and lab or industrial experiments in master degree works. It is necessary to analyze and to correct teaching programmes of courses concerning mathematical statistics and experiment planning.
2. To select in separate course the study of the newest processes and technologies of metallurgy for all masters of the direction «Metallurgy».
3. To undertake measures necessary to practice all masters students in the area of patent search. E.g. inclusion to the education program of the course on theory and practice of invention and intellectual property protection is advisable.
4. To provide to masters the access to Internet resources.
5. To extend training on master level of foreign language in the proper professional fields. To toughen the requirements to obligatory use of modern foreign scientific and technical publications. To ensure completeness of the information search on the investigated problem it is necessary to foresee the introduction to bibliographic catalogues, reference books and other type of bibliographic sources.
6. To continue purchase of the specialised software for scientific research (e.g. Thermocalc, Chemsage, HSC, MATLAB, etc.).
7. To emphasise the practical and laboratory work.
8. To provide the obligatory publication of masters' theses abstracts on the web-site of Academy.

