

MECHATRONICS OF MOTOR ROAD VEHICLES

Dušan Maga, René Hart'anský

Faculty of Mechatronics, TnUAD, Študentská 1, 911 50 Trenčín

Abstract

Faculty of Mechatronics, Alexander Dubček University of Trenčín, offers to its applicants three study programmes in two study disciplines. The most important programmes are Quality Management and Mechatronics. Besides these, respecting the region where this university has been and already is located, the faculty has received the rights to realize the study programme Mechatronics of Motor Road Vehicles (MMRV). One of the bases of this study programme is on subjects oriented on electrical engineering.

Three of word most important automobile producing companies can be found near to the region of Trenčín (within distance of 140 km). This powerful industry produces the mayor part of economical results in Slovak Republic, especially concerning the export statistics. Also the numerous activities in secondary and tertiary subcontractors sphere can be observed in the region. This is very closely associated with request for qualified and educated labour power; however, this request is mostly oriented on bachelor study programmes graduates.

1.PROFILE OF GRADUATES

Bachelor study programme Mechatronics of Motor Road Vehicles is pointed on preparation of experts with mechanical-and-electrical engineering skills with knowledge of bases of computer science, industrial automation, testing and operation of automobile industry products [1, 2]. All these are understood as complex and complicated mechatronic systems. This comes from fact, that the mentioned machinery and technologies have a high level functional, motional and manipulating abilities. Mostly are driven and controlled by modern automation and computer based technologies, numerical (mostly distributed) systems.

Graduate will receive all necessary theoretical knowledge, needed to understand the bases of technical disciplines within the scope of mechanical engineering, electrical engineering and electronics, technical cybernetics, as well as of disciplines based on computer sciences. Based on these knowledge, his attainments are oriented deeper in technical disciplines to better cognition of single operational entities, as well as synthesis of whole system.

2. CAREER OF GRADUATES

Graduates of bachelor study programme Mechatronics of Motor Road Vehicles can be employed in industrial companies oriented on automobile industry, as well as in companies cooperating with these ones. Can be used in featuring the technological aspects of industrial production preparation, installation and assembly problems, testing and adjusting the production lines, controlling the production itself, testing and adjustments of operation parameters, troubleshooting and quality assurance of whole production process. He can also be used in assurance of post-production processes, especially in organization of market and services.

3. COMPOSITION OF SUBJECTS

Twenty seven compulsory subject are offered to students during they study at FM TnUAD, including the foreign language (this lasts four semesters), and eight optional subjects, which can be chosen according to the principle of obtaining the required number of credits during the period of evaluation. These subject are usually offered in pairs, eg subject ORCAD has its alternative in subject CATIA. Except of these, students are able to choose some from three recommended subjects, educated in areas of economics, law and philosophy.

It is possible to quantify from this offer 10 subjects (23,6%) as subjects based on electronics or scientific disciplines very close to electronics. Next 9 subjects are pointed to computer sciences or related disciplines. The following subjects can be classified as basic electrotechnical oriented: Basics of Electrical Engineering, Electronics, Electromechanical Engineering, Electrical Actuators and Drives, Electronic Control Systems of Automobiles, Electromobiles and Hybrid Automobile Systems, Electromagnetic Compability (EMC) [3 – 8].

4. PROGRESS OF STUDENTS' INTEREST

The mentioned study programme is offered to students only for second academic year. Since nowadays the whole study cycle has not been completed yet, it is difficult to evaluate the education process. Faculty is interested in accreditation of second degree (master of science), however, the graduates of MMRV are able to continue theirs study in study programme Mechatronics. Number of students in study programme MMRV can be seen in following table.

Table 1 – Number of Registered Students in Study Programme Mechatronics of Motor Road Vehicles

Academic Year	Number of Regular Students (Percentage From Total Number of Regular Students)	Number of External Students (Percentage From Total Number of External Students)
2005/2006	32 (3,8%)	20 (7,5%)
2006/2007	63 (8,3%)	31 (9,8%)

5. CONCLUSION

This paper presents the latest activity of Faculty of Mechatronics TnUAD in field of accreditation of new study programmes. The basic features of offered study programme (Mechatronics of Motor Road Vehicles) are presented, including the brief description of graduate profile and his (her) possible application in labour market. The overview of important subjects, oriented at electronics and electrical engineering (including the power electronics) are also presented in the paper. The progress of students' interest is briefly indicated. According to this, the presumption of faculty is that the interest is increasing and still will increase in the close future, as well as theirs ration on total number of students at Faculty of Mechatronics, TnUAD.

REFERENCES

KOPES 2007

- [1] D. Maga: Bachelor Study Programme Mechatronics of Motor Road Vehicles (in Slovak: Študijný program bakalárskeho štúdia Mechatronika cestných motorových vozidiel), pp. 18 – 23, Kongo 2006, Konferencia garantov študijných programov FM TnUAD, TnUAD Trenčín, Slovakia 9. 5. 2006, ISBN 80-8075-145-5
- [2] D. Maga, V. Ráček: Offer of Study Programmes for Foreign Students at Faculty of Mechatronics, Alexander Dubcek University of Trencin, pp. 144 – 150, ISTU Russia, Proceeding of Technical Univerzities: Integration with European and World Education Systems, 25. - 27. 4. 2006 ISBN 5-7526-0260-2
- [3] P. Bauer, J. Leuchter.: Modern Education of Power Electronics by Simulation and Animation. WSEAS Transaction on Advances in Engineering Education, ISSN 1790-1979, Issue 3, Vol. 3, pp. 204-208, WSEAS Press, 2006.
- [4] Sitár, J.: Automatized Electrical Drives for Students of Mechatronics on Faculty of Mechatronics (- in Slovak: Automatizované Elektrické Pohony pre Študentov Odboru Mechatronika na Fakulte Mechatroniky), XX. Medzinárodné sympóziu učiteľov elektrických pohonov, SYMEP 2004, 22.-24., Júna, Praha, ISBN: 80-01-03018-0
- [5] Sitár, J.: Visualisation of Electromagnetic Fields for Students of Faculty of Mechatronics, (in Slovak: Vizualizácia Elektromagnetických Polí pre Študentov Fakulty Mechatroniky, 7th International Symposium of Mechatronics), Mechatronika 2004, Ráčková dolina, Slovakia, 24-26, Máj, 2004, ISBN 80-227-2064-X, Last Minute Papers
- [6] Sitar, J., Halgoš, J.: Use of Numerical Methods in Education Within the Scope of Electyric Machinery (in SLOvak: Využitie numerických metód pri výuke v oblasti elektrických strojov), XXI. Medzinárodné sympóziu učiteľov elektrických pohonov, SYMEP 2006, 13.-15., Júna 2006, Plzeň - Nečtiny, ISBN: 80-7043-455-4
- [7] Thurský B., Hricko J., Páleník T.: Matlab Web Server as an Interactive Tool in Education Process (in Slovak: MATLAB Web Server ako interaktívny prostriedok vo výučbe), 13th Annual Conference Proceedings of Technical Computing Prague 2005 [CD-ROM]. Praha: Humusoft, 2005, ISBN 80-7080-577-3
- [8] Binka, J., Hricko, J.: New Tools in Technical Subjects (in Slovak: Nové prostriedky v odbornom predmete), In: SEKEL 2006, Medzinárodný odborný seminár katedier zabezpečujúcich výučbu elektrotechnických predmetov na neelektrotechnických fakultách, 12 – 14, september 2006, Vrátna, Slovakia, ISBN 80-8070-584-4 , s.42-46.