



**ЧЕСТИТ ЮБИЛЕЙ!**

**5 години “Механика Транспорт Комуникации”**

**Congratulations on the 5<sup>th</sup> anniversary  
of Mechanics Transport Communications**

***ПЪРВИЯТ ЮБИЛЕЙ – РЕЗУЛТАТИ И ПЕРСПЕКТИВИ***  
***THE FIRST JUBILEE: RESULTS AND PERSPECTIVES***

Началните пет години са важен период в живота не само на всеки човек, но и на неговите творения. Това важи особено когато те са създадени с ентузиазма на пионерите в едно новаторско за началото на 21 век дело, каквото е електронната научна периодика.

Списание то „Механика Транспорт Комуникации” (<http://www.mtc-aj.com>), което излиза и в книжен формат (ISSN 1312-3823), се появява през 2003 г. в резултат на проекта “Нови дейности във виртуалното пространство на Центъра за наука, информация и международен академичен обмен” във ВТУ “Т. Каблешков, осъществен по програма „Образование” на фондация “Отворено общество”. В редколегията му са привлечени едни от най-известните учени в областта на техническите науки от ВТУ “Т. Каблешков”-София, ТУ - София, ТУ - Габрово и ВСУ “Л. Каравелов”- София.

Мисията на списанието е „да концентрира интересите на по-голям кръг научни работници, за сметка на по-разширената предметна област и двуезичното си отпечатване”, „да

The first five years are an important period in the lives not only of people but also of their works. That is especially true when they have been created with the enthusiasm of pioneers of such an innovatory performance at the beginning of the 21<sup>st</sup> century as electronic scientific periodicals..

The Mechanics Transport Telecommunications journal (<http://www.mtc-aj.com>) published also in a paper version (ISSN 1312-3823) appeared in 2003 as a result of the project “New activities in virtual space of the Center of Research, Information and International Academic Mobility” at the Higher School of Transport (VTU) developed under the Education program of Open Society Fund. Some of the most prominent scientists from the VTU, Technical University of Sofia, Technical University of Gabrovo and the Higher School of Civil Engineering in Sofia were included in its Editorial Board.

The journal mission is “to concentrate the interests of a greater number of scientists by widening the field of subjects and bilingual issues”, “to popularize the achievements of the

популяризира постиженията на български изследователи, като публикува и материали от чуждестранни автори, представляващи интерес за професионалната общност". По такъв начин се излиза от омагьосания кръг на тясната специализация и се създава възможност за изява на по-голям кръг изследователи от страната и чужбина. Освен информативни функции, изданието все повече осъществява и комуникативни – като начало на запознаване с работата на научната колегия и създаване на професионални контакти в съответните проблемни области.

Правилата за публикуване са ясно определени – веднага след получаване на положителни рецензии от двама хабилитирани рецензенти, което е гаранция за високото качество на разработките. Печатният вариант на списанието се депонира в основните национални библиотеки и се предоставя при определени условия на всички желаещи да го получат.

Списанието, което излиза два пъти годишно, вече има 10 броя. Във всеки от тях се включва уводна статия, която е на актуална тема, свързана с приоритети на научно-техническите изследвания, както и в научната и образователна политика. Отпечатани са общо 101 статии, като 91 от тях са разпределени в тематичните раздели на изданието – „Механика и мехатроника”, „Транспортна техника и технологии”, „Комуникационна и осигурителна техника”, „Електроника и електротехника”, „Екология и химия”, „Материалознание и технологии на материалите”, „Строителство и архитектура”, „Икономика, технология и управление на транспорта”.

Макар и да има публикации на английски език, до брой 2/2005 г. те са от български автори. Първите

Bulgarian researchers as well as to publish international authors' papers that present a certain interest to the professional community". In this way it is possible to get out of the vicious circle of narrow specialization and to make possible the contributions of much more researchers from the country and abroad. Besides the information function, the journal has been increasingly developing communication activities: acquainting with the expertise and experience of scientists from different countries and establishing professional contacts in corresponding fields of research.

The rules of publishing are distinctly defined: right after receiving positive reviews of two reviewers of academic rank, which is a guarantee of the high quality of papers. The paper version of the journal is submitted to the main national libraries and can be given to all who want to receive it under certain conditions.

The journal, which is biannual, has already had 10 issues. Each of them has editorial that is on a topic of the day connected with the priorities of research and technical development as well as science and education policy. The published papers are 101 and 91 of them are distributed in the thematic sections of the issue: „Mechanics and Mechatronics”, „Transport Equipment and Technology”, „Communication and Security Equipment”, „Electronics and Electrical Engineering”, „Ecology and Chemistry”, „Material Science and Material Technology”, „Building Construction and Architecture”, „Transport Economy, Technology and Management”.

Although some publications are in English, up to issue 2/2005 they have been of Bulgarian authors. The first foreign scientists whose papers appeared

чуждестранни изследователи, чиито статии се появяват в списанието, са от Университета в Жилина, Словакия – Йозеф Клучка (Факултета за специално инженерство), Йозеф Майерчак и Петер Майерчак (Факултет за експлоатация и икономика на транспорта и съобщенията). Следват изявите на преподаватели от Бърно и Пардубице, Чехия; Кралеве, Сърбия; Москва, Русия; Минск, Беларус. Макар че международното участие е все още едва една десета (общо десет публикации), в редколегията са постъпили и очакват публикуването си още няколко разработки. Интересно е да се отбележи, че една от уводните статии маркира тенденцията за съвместни изяви – доц. д-р инж. Нели Стойчева от ВТУ „Тодор Каблешков” и д-р инж. Роман Словак от Технически университет в Брауншвайг, Институт по безопасност на трафика и Автоматизация (Германия) представят в брой 1/2006 г. успешното международно сътрудничество между двете страни.

Миналата година списание „Механика Транспорт Комуникации” излезе с извънредно издание, което представя докладите от XVII Международна научна конференция "TRANSPORT 2007". Тази успешна практика ще бъде продължена и за следващите конференции "TRANSPORT", организирани от ВТУ „Тодор Каблешков”.

Петте години на едно от първите научни списания във виртуалното пространство и по-специално в България са основание за реалистична оценка и оптимистични перспективи. Съществуват много нови възможности за разгръщане на информационния му потенциал – съвместни броеве или рубрики с

in the journal were from the University of Zilina, Slovakia: Jozef Klučka (University of Žilina, Faculty of Special Engineering, Department of Crisis Management), Jozef Majerčák and Peter Majerčák (Faculty of Operation and Economics of Transport and Communication). The publications that followed had been sent by researchers from Brno and Pardubice, Czech Republic; Kraljevo, Serbia; Moscow, Russia; Minsk, Belarus. Although the international participation is still 1/10<sup>th</sup> (10 publications), the Editorial Board have received some other papers waiting to be published. It is interesting to emphasize that one of the editorials was written in co-authorship: Assoc. Prof. Nelly Stoytcheva, PhD from the Higher School of Transport and Eng. Roman Slovak, PhD from the Technical University in Braunschweig, Institute of Traffic Safety and Automation (Germany) presented the successful cooperation between the two institutions in issue 1/2006.

Last year the Mechanics Transport Telecommunications journal published an extra issue containing the Proceedings of the 17<sup>th</sup> International Scientific Conference TRANSPORT 2007. That successful practice will be continued before the next conferences TRANSPORT organized by the Todor Kableshkov Higher School of Transport, Sofia.

The 5<sup>th</sup> anniversary of the Mechanics Transport Telecommunications, which is one of the first scientific journals in the virtual space and especially in Bulgaria, gives a good reason to make a realistic assessment and outline optimistic perspectives. There are a great number of new possibilities to develop its information potential: joint issues or headings with other scientific e-journals

други научни електронни и печатни издания, обмен на публикации, включване на чуждестранни учени в редколегията, предоставяне за рецензиране, инициране на дискусии и семинари. Списанието следва да се развива по посока интернационализиране като съдържание и организация, защото науката е приоритет за бъдещето не само на България, но и на страните от ЕС. Не случайно политиката на Европейската комисия е насочена към стимулиране на сътрудничеството и създаване на Европейско изследователско пространство.

**Главен редактор на списание**  
„Механика Транспорт Комуникации”

**проф. д-тн инж.-мат. Петър Колев**  
**Prof. Petar Kolev, DSc**



Уважаеми читатели на списанието  
„Механика Транспорт Комуникации”

Едва ли има някой, който се съмнява във факта, че най-важните фактори за просперитета на една държава, а и на човечеството въобще са транспорта, комуникациите и индустрията. Списанието е посветено пряко на първите два фактора-transporta и комуникациите. Механиката наред с технологиите е в основата на индустрията, така че списанието е посветено на три изключително важни тематични направления. В този смисъл неговото значение е безспорно. Поздравявам всички автори, публикували свои научни трудове в това списание с навършването на 5 години от създаването му и пожелавам на създателите на списанието и редакционната му колегия нови успехи.

**Председател на редакционната колегия**  
**на списание "Механика на машините"**

**проф. Н. Минчев**  
**Prof. N. Minchev**



and printed journals, exchange of papers, including scientists from other countries as members of the Editorial Board and/or reviewers, initiating discussions and seminars. The journal should develop towards further internationalization both as contents and organization because science and research are priorities not only for the future of Bulgaria, but also of all EU member states. It is not occasional that the policy of the European Commission is intended to stimulate cooperation and the establishment of the European Research Area (ERA).

**Editor-in-chief**  
Mechanics Transport Telecommunications  
journal

Dear readers of **Mechanics, Transport, Communications** journal,

There is hardly anybody who doubts about the fact that transport, communications and industry are the most significant factors for the prosperity of a country as well as altogether of mankind. The journal is directly dedicated to the first two factors, transport and communications. Besides technologies, mechanics lies in the fundamentals of industry, so the journal is dedicated to three extremely important thematic trends. In that sense its significance is undisputable. I congratulate all authors who have published their scientific works in that journal on 5<sup>th</sup> anniversary of its establishment and wish new achievements to its founders and editorial board.

**Chair of the Editorial Staff of Mechanics**  
**of Machines journal**

**УВАЖАЕМИ ПРОФ. КОЛЕВ,  
КОЛЕГИ РЕДАКТОРИ,  
СКЪПИ ПРИЯТЕЛИ,**

В епоха на промени, във време, когато комерсиалното мислене и материалните ценности превземат бита, *5 годишен юбилей* на едно научно списание е своеобразна победа. Победа на духа над дребнотемието, над пошлостта.

Именно трудът на учените движи познанието, а оттам и цялата човешка цивилизация. Вашите автори са хора, пренебрегнали личната суета в името на техническото откривателство, което не блести в светлината на прожекторите, но върти колелото на живота и го прави по-комфортен, по-красив. Вече 5 години списанието ви е трибуна за едни от най-стойностните представители в областта на механиката, транспорта и комуникациите, които на страниците му споделят опита си и с обмяната на идеи тласкат напред развитието на сектора.

Желаем щастлив празник и успех на  
сп. МЕХАНИКА ТРАНСПОРТ  
КОМУНИКАЦИИ

Знаем, че ще устои на превратностите, защото VERBA DOCENT, EXAMPLA, TRAHUNT или: "Думите учат, примерите привличат".

**ЧЕСТИТ РОЖДЕН ДЕН!**

**Цветина Русева  
Кристиан Скасо  
Ръководители на GROUPE ACTIS  
Франция – България и съиздатели на  
сп. ЖЕЛЕЗОПЪТЕН ТРАНСПОРТ**

**DEAR PROF. KOLEV,  
DEAR COLLEAGUES EDITORS,  
DEAR FRIENDS,**

During the age of changes, at the time when commercial considerations and material values have conquered the way of life, the 5<sup>th</sup> anniversary of a scientific journal is a kind of victory over trivial topics and banality.

It is the work of scientists that moves ahead knowledge, hence the entire human civilization. The authors of papers in your journal are people who have neglected their personal vanity in the name of engineering discoveries, which do not shine in the spotlights but steer life and make it more comfortable and nice. It is 5 years since your journal has become a forum for the most respected representatives in the field of mechanics, transport and communications, who share their experience on its pages and, exchanging ideas, carry forward the sector.

We wish a nice celebration and good luck to MECHANICS TRANSPORT COMMUNICATIONS journal. We believe that it will withstand against ups and downs of life because VERBA DOCENT, EXAMPLA TRAHUNT or "Words teach, examples draw up".

**CONGRATULATIONS!**

**Tsvetina Rousseva  
Christian Scaso  
Managers of GROUPE ACTIS France –  
Bulgaria and co-publishers of RAILWAY  
TRANSPORT magazine**

**Машинен факултет, Кралеве, Сърбия**  
**Faculty of Mechanical Engineering (MFK), Kraljevo, Serbia**

**Уважаема редакция,**

Имаме особената чест и удоволствие да честитим юбилея на електронното списание “Механика Транспорт Комуникации”. Приемете нашите поздравления за професионалното оформяне на списанието, което е с подчертан принос за развитието на транспортната наука и се ползва с признанието на сръбските учени.

Успешното сътрудничество между ВТУ “Тодор Каблешков” и Машинния факултет датира още от 2002 г., когато ваши представители взеха участие в конференцията “Тежко машиностроене”, състояла се в Кралеве. Същата година делегация от Машинния факултет гостува във ВТУ по повод международната научна конференция “Транспорт 2002”. Създадите се отлични колегиални и приятелски отношения доведоха до успешно по-нататъшно задълбочаване на контактите между учени от нашите институции и до реализирането на съвместен проект по 6 Рамкова програма, както и до ред други взаимоползни инициативи, намерили място в списанието.

Уважаеми колеги, приемете нашата висока оценка. От все сърце ви пожелаваме да работите все така добре и в бъдеще!

**Проф. д-р Ранко Раканович, Доктор  
хонорис кауза на ВТУ “Т. Каблешков”**

**Проф. д-р Драган Петрович**

**Dear colleagues from the Editorial Board,**

We are extremely honored to send you our congratulations on the 5<sup>th</sup> anniversary of the e-journal Mechanics Transport Communications. We would congratulate you on the well-done professional job, which is considerable contribution to the development of science in the field of transport and which is acknowledged by the Serbian scientists.

The successful cooperation between the Higher School of Transport (VTU) and the Faculty of Mechanical Engineering (MFK) has been existing since 2002 when your representatives took part in the Heavy Machinery Conference held in Kraljevo, Serbia. It was the same year when a delegation from MFK visited the VTU on the occasion of the International Scientific Conference Transport 2002. The close professional and friendly relations established then resulted in further extension of the contacts between the scientists from our two institutions and development of a joint project under the FP6 of the EC as well as to implementation of other activities of common interest.

Dear colleagues, we highly appreciate your efforts. We wish you to work in future as much effectively as up to now.

**Prof. Ranko Rakanovic, PhD, Doctor  
Honoris Causa of the VTU**

**Prof. Dragan Petrovic, PhD**

**Уводна статия**  
**Introductory article**

**COMPARATIVE ANALYSIS OF THE TEACHING SUBJECT MATTER  
FOR THE SUBJECT “DATA BASES” ON THE CASES OF THE  
FACULTIES OF THE UNIVERSITY OF ŽILINA AND THE RAILWAY  
COLLEGE BELGRADE**

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SERBIA*

**Key words:** *Databases, comparative analyze*

**Summary:** *This article describes experience and knowledge gained by solving TEMPUS project in Slovak Republic. The aim of project was to adjust content and methods of teaching of Informatics in Serbia and Montenegro according to model used in Slovak Republic.*

### **Introduction**

During last year individual mobility grant IMG-SCG3018-2005 was conducted within the framework of the TEMPUS project. The action of the grant was: Updating the teaching programs for the subjects of 'Computers' and 'Algorithms and Programming' in accordance with the new High Education Act of the Republic of Serbia and the transition of the Railway College to the level of higher education according to the Bologna Declaration. The action was performed at the faculties of the University of Žilina and at the faculties of the Slovak Agricultural University in Nitra. One of the planned and realized activities was to make a comparative analysis of the teaching subject matter for the subject “Data Bases” which is taught at the Railway College with similar subjects which are taught at the Universities of Žilina, and drawing up a proposal for a new plan and program, as well as forming a proposal for the ECTS credits.

### **Comparative Analysis of the Teaching Subject Matter for the Subject: Data Bases**

#### **1. Railway College Belgrade (RCB)**

The subject “Data Bases” is the third module of the subject “Computers”. Its intension is to enable students to get basic theoretical knowledge, to understand methods and models of computer oriented data bases. Also the module aims to give students necessary skills for exploiting data bases using computers and to make them the following phases in their education easier.

The subject’s matter covers:

- Data base concept; Entity, attribute, domain, file, data base and entity relationship, information systems;
- Data base types-architecture; different DB models, masters work with specific data base system, examples;

- Basics of Creating information systems; Real IS analyzing and modeling; Methodologies for real system modeling; data model: model Entity-Relation; Models of functions; Examples;
- Relational DBS; relational algebra, relational calculus, entity normalization, types of relations, relations restoration, E-R into relational model transforming;
- Modeling and creation DB tools; data modeling and function modeling; logical model making, logical model transforming into physical model, example ErWin and BpWin;
- Physical realization of DB; resources, software, entity physical organization; forms and queries creating; using of MS ACCESS;
- Application security;
- Multiuse of DB.

Railway College has its own textbooks for this module.

As the teaching method for lectures, frontal method is chosen because of the great number of students. Beside the 28 hours of lectures, students have also 14 hours exercises in classroom practicing on examples and 14 hours in computer classroom making exercises. Student also has to make a seminary work. These activities give student opportunity to earn up to 50 scores. Seminary work could bring up to 25 scores, and practical work could result with 25 scores too.

Examine is of written type, test, and student can score up to 50 scores.

Final grade is gained by adding of all scores and dividing the total score by 10 rounding to nearest whole number.

Student passes exam when the final grade is 6 or more, up to 10. If the final grade is 5 or less student did not pass exam. For this module student earns 6 ICTS credits.

## **2. University of Žilina**

### ***2.1. Faculty of Special Engineering (FSE)***

At the Faculty of Special Engineering there is a subject “Informatics-Programming-Databases” but it is not included in the bachelor study. It is in the fourth year and it is a part of engineer study. Its curricula is likewise the curricula of the RCB subject Data Base, but given in shorter form.

Subject is realized through 24 hours exercises, seminary work and final examen. Passing the exam student earns 3 ECTS credits.

Because of different levels in education it is not to expect recognition of this subject in RCB, but FSE has a real base to recognize RCB subject Data Base which has more lesson hours and covers wider area of DB-s.

### ***2.2. Faculty of Operation and Economics of Transport and Communications (FOETC)***

At the Faculty of Operation and Economics of Transport and Communications (FOETC) there is subject “Informatics 1” that touches data bases. But this “touch” is very slight, only through a few hours of exercises. Through lab work there is planed work with data bases-tables, entities, forms, configurations, macros. Because of the planed number of hours it seems that student must learn alone this matter.

There is also a subject “Programming” that also touches data bases with 6 hours of lectures and 6 hours of exercises.



These subjects could not be comparable with RCB Data Base module alone and will not be further analyzed.

### **2.3. Faculty of Management Science and Informatics (FMSI)**

At the Faculty of Management Science and Informatics (FMSI) there exist two bachelors' degree programs treating data bases: "Basics of Database Systems" and "Database Systems – MS Access"

#### **Basics of Database Systems**

The subject "Basics of Database Systems" is planned for 6<sup>th</sup> semester of Bachelors Degree Studies, major Informatics with 24 hours of lectures and 24 hours lab works in semester.

Aims and objectives of the subject are:

- |                                                                                                                                                |                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>- Database systems design and creation principles.</li> <li>- Using of different data files.</li> </ul> | <ul style="list-style-type: none"> <li>- Manage work with particular database system.</li> <li>- Data definition and data manipulation language.</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|

The course consists of:

Lectures:	Laboratory work:
<ul style="list-style-type: none"> <li>- Basic concepts.</li> <li>- Database systems architecture.</li> <li>- Entity-Relationship model.</li> <li>- Relational DBS.</li> <li>- Relational integrity.</li> <li>- Relational algebra.</li> <li>- Normal forms (1NF, 2NF, 3NF, BCNF).</li> <li>- Introduction to SQL.</li> <li>- Data manipulation in SQL.</li> </ul>	<ul style="list-style-type: none"> <li>- Creating of own DB system and information system on existing DBS.</li> <li>- Creating of database, tables, data types.</li> <li>- Creating of simple and multi-table forms.</li> <li>- SQL statements – INSERT, UPDATE, DELETE, SELECT.</li> <li>- Creating of reports and menus.</li> <li>- Masters work with specific database system.</li> </ul>

The Faculty has own literature, but in the course description there are items of other publishers.

Assessment is through:

- Recognition of course work – 15%
- Written and oral examinations - 85%

After passing exams student earns 6 ECTS credits.

#### **Database Systems**

The subject "Database Systems – MS Access" is planned for 5<sup>th</sup> semester of Bachelors Degree Studies, majors Informatics, Computer Engineering and Management with 24 hours of lectures and 24 hours lab works in semester.

Aims and objectives of the subject are:

- Manage work in database management system ACCESS.
- Creation of database, tables, forms, queries, reports, macros and modules.
- Programming of procedures and functions by means of Visual Basic language.

The course consists of:

#### Lectures:

- Creating of database and tables.
- Data types of table attributes.
- Forms and queries creating.
- Details of SQL SELECT statement.
- Creating of reports, macros and applications.
- Principles of modules and procedures creation.
- Visual Basic for Applications – declaration of variables, user types, constants.
- Using of objects and collections.
- Work with OLE and DDE object and with extern data.
- Creating and using of libraries. Application security.

#### Lab work:

- Database creating in MS ACCESS environment – creating of tables, forms, queries, reports and macros.
- Applications creating by means of Visual Basic for Application – creation of modules, procedures.
- Using of objects and collections, programming code tuning, treatment for errors.
- Work with OLE and DDE objects.
- Creating and using of libraries.
- Application security.
- Master work:
- Information system in MS ACCESS environment.

In the course description there are items of foreign publishers.

Assessment is through:

- Recognition of course work – 15%
- Written and oral examinations - 85%

After passing exams student earns 4 ECTS credits.

Analyzing both subjects it could not be avoided the notice that recommended order of the subject is strange. Normally student would get the basic knowledge before and then special knowledge. Here, for major Informatics, students learn special software MS Access first, and after finishing of the course they started to learn common things. This is also a possible way of learning, but little unusual. The reason could sit in the fact that this subject belongs to other majors of the faculty: Computer Engineering and Management. They do not have the Basic of Database System, and subject Database Systems – MS Access is only DB subject for them, and such plan is surely a compromise connected with funds.

Both subjects are comparable with RCB subject Data Bases and could be a matter of recognition.

#### **2.4. Faculty of Electrical Engineering (FEE)**

At the Faculty of Electrical Engineering there exists a subject named “MS OFFICE in Technical Praxis” planed for the first semester in the first year of studies at the major “Telecommunications”.

In the plan there is a part of MS Access.

The aim of the subject is to give students practical skills in PCs, to show MS DOS, MS Windows, text processors, spreadsheets and databases. Student learns MS DOS, Norton Commander, basics of MS Windows, MS Word, Access and Excel. For the subject it is planed 13 hours of lectures and 26 hours of lab works. Listed literature is from the foreign publishers. After finishing the course and passing final exam student earns 4 ECTS credits.

Comparing the subjects from FEE and RCB it can be concluded that the differences are enormous and that there is no possibilities of recognition of ECTS credits. On the RCB side there is a greater number of teaching hours, and on the FEE side are only basics in MS Access.

### **3. Slovak Agricultural University in Nitra**

#### ***3.1. Faculty of European Studies and Regional Development (FESRD) – Nitra***

At the Faculty of European Studies and Regional Development (FESRD) in Nitra there exists a subject named “Database Systems” in the sixth semester, and it could be comparable with the third module of RCB subject “Computers”: Data Bases.

For the subject matter it is reserved 14 hours for lectures and 42 hours for lab work.

The course consists of:

Lectures, that covers:

- |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>- The basic mélange from DB systems: entity, database, system, managing databases, structure...</li> <li>- Creating of database and tables.</li> <li>- Methods of programming databases – structural and object. Basic mélanges in programming, program, subroutine, cycles, editors...</li> <li>- Data types of table attributes.</li> <li>- Forms and queries creating.</li> </ul> | <ul style="list-style-type: none"> <li>- Creating of reports, macros and applications.</li> <li>- Principles of modules and procedures creation.</li> <li>- Using of objects and collections.</li> <li>- Main program creating, compilation and using of libraries in chosen database system. Application security.</li> <li>- Database systems in MS Windows environment. Projects, tables, forms, SQL.</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Lab work, which fully covers lectures:

- Database creating in dBase III Plus environment in the first 33 hours of lab works.
- Database creating in Visual dBase 7 in the following 6 hours of lab works.
- The last 3 hours are planed for the final test.

Examen is of oral type, and after passing of exam student earns 6 ECTS credits.

This subject is very professional planed, but it is mostly incomparable with RCB subject Data Bases so it could not be a matter of recognition on both sides RCB and FESRD.

#### ***3.2. Faculty of Economics and Management (FEM) - Nitra***

At the Faculty of Economics and Management (FEM) in Nitra there exists no subject concerning data bases. There are fragments in the subject Statistics, but it is incomparable with RCM Data Bases.

### **Conclusions for the RC Module: Data Bases**

Analyzing all available programs concerning Operation Systems and Business Software courses of seven higher education institutions from three universities it is possible to conclude that a variety of approaches is in practice. Practically there are faculties that practically have no subject concerning data bases as FOETC, FEE and FEM. It is little strange, because DB systems are everywhere even in the small stores. The reasons could be numerous as mentioned before but, again, the main reason could

be that 3 years study for bachelor degree is too short to give students special knowledge from majors they chosen and that the faculties must reduce other contents. Some of the faculties, like FMSI, have very ambitious programs in data bases, even two subjects. All named faculties as well as RCB are using predominantly MS Access, while FESRD has ambitious program, but based on dBase III. The other faculties who are not specialized in computer technics expect students of different profiles, and their programs include business software and basics of operation systems, mostly MS Windows. Verily they also have a bit of data bases in the Windows environment.

As mentioned, it is also interesting that some of the faculties start with MS Access, and then in the next semester have MS Excel.

All institutions put in their programs lot of titles covering wide area of data bases and data bases tools. It is questionable if they can cover all items with very different number of hours. In the following table short revue of school hours concerning data bases is given.

**Table 2 Revue of schools hours used for data bases**

No.	Higher Institution	Lectures [h/semester]	Exercises [h/semester]
1	RCB	28	28
2	FSE	0	24
3	FOETC	0	~4
4	FMSI	48	48
5	FEE	~2	~4
6	FESRD	14	42
7	FEM	~0	~0

In the table it could be seen that RCB and FMSI have approach that lectures are the means to give student a common knowledge and to prepare them for practical work. It is also a possibility to save resources in lecturers in the case of greater number of students. But giving a lot of time for lectures could also lead to deep theory. Maybe better combination is as in FESRD: less number of lectures, and more of lab works, but it rise costs. Working in small groups gives a possibility to avoid classic lectures and to work in labs, as in FSE, but it is applicable only for a small number of students.

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**СРАВНИТЕЛЕН АНАЛИЗ НА УЧЕБНОТО СЪДЪРЖАНИЕ  
НА ДИСЦИПЛИНАТА “БАЗА ДАННИ” В ПРАКТИКАТА НА  
ФАКУЛТЕТИТЕ НА УНИВЕРСИТЕТА В ЖИЛИНА И ВИСШЕТО  
ЖЕЛЕЗОПЪТНО УЧИЛИЩЕ В БЕЛГРАД**

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*Ключови думи: База данни, сравнителен анализ.*

*Резюме: Тази статия описва опита и натрупаните знания в проекта по програма TEMPUS в Словакия. Целта на проекта беше да се пригледят съдържанието и методите на преподаване на Информатика в Сърбия и Черна гора към модела, използван в Република Словакия.*