

University of Maribor

Faculty of Natural Sciences and Mathematics

Facts and figures for the EUA evaluation

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1 General information

Faculty of Natural Sciences and Mathematics, University of Maribor

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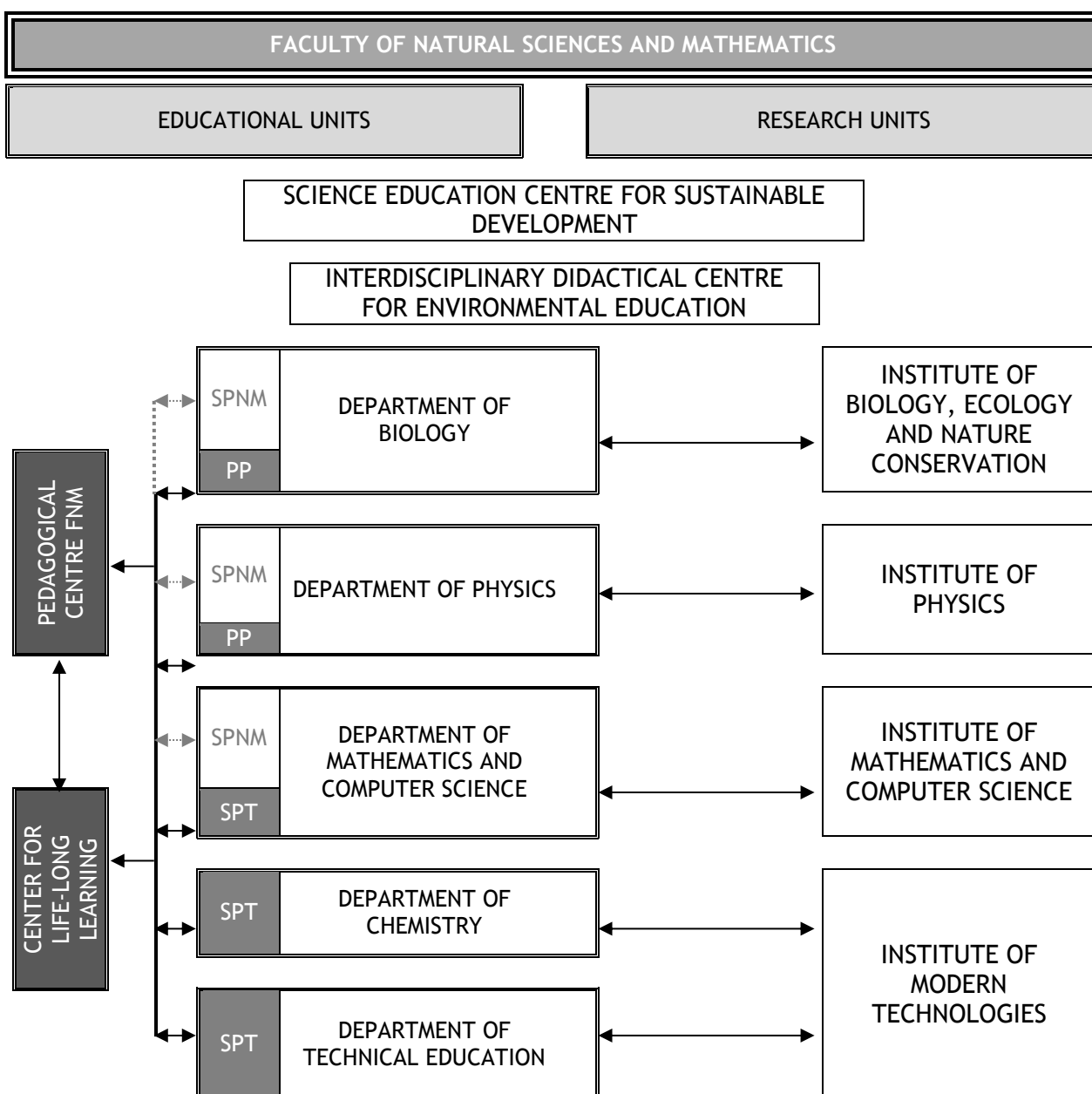
F: +386 2 2518 180

web: <http://fnnm.uni-mb.si/index.php?lang=en>

Year of establishment of the faculty: 2006 by transformation of former Faculty of Education

Year of establishment of the departments that constitute the faculty: 1960

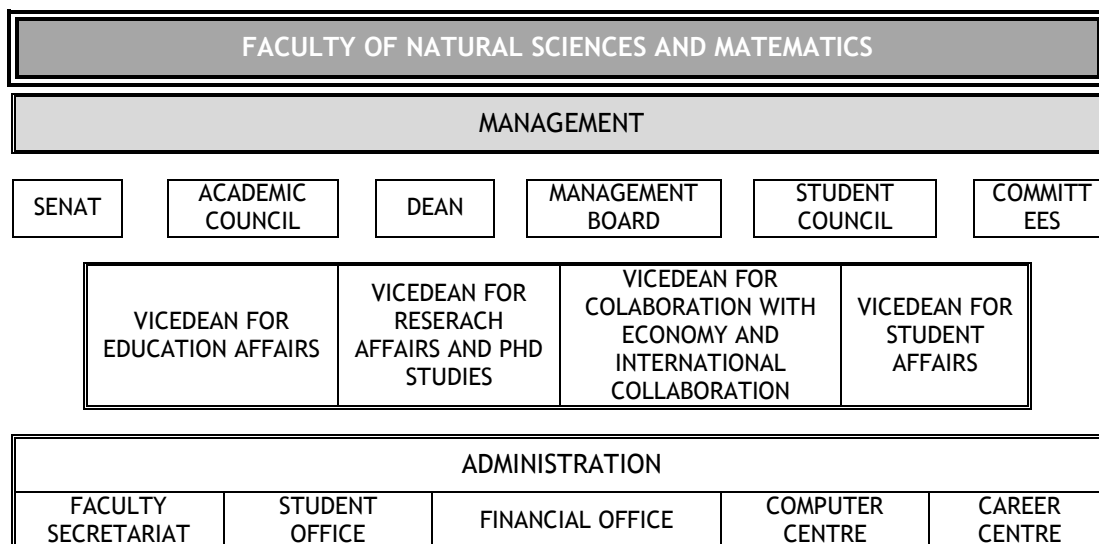
2 Educational, research and management units



Legend:

SPT - Study Programs for Teachers

SPNM- Study Programs in the field of Natural Science and Mathematics



3 Study Programs

<p style="text-align: center; color: #0070c0;">Undergraduate study programs (BSc level)</p> <ul style="list-style-type: none"> Physics Mathematics Biology Ecology with Nature conservation 	<p style="text-align: center; color: #0070c0;">Undergraduate double major study programs (BSc level)</p> <ul style="list-style-type: none"> Educational Biology Educational Physics Educational Chemistry (joint degree with FKKT⁽¹⁾) Educational Mathematics Educational Computer Science (joint degree with FERI⁽²⁾) Educational Design
<p style="text-align: center; color: #0070c0;">Graduate study programs (MSc level)</p> <ul style="list-style-type: none"> Biology and Ecology with Nature conservation Mathematics Physics 	<p style="text-align: center; color: #0070c0;">Pedagogical graduate study programs (MSc level)</p> <ul style="list-style-type: none"> Educational Design - double major Educational Physics - double major Educational Chemistry - double major Educational Biology - double major Educational Mathematics - single and double major Educational Computer Science - double major (joint degree with FERI⁽²⁾)
<p style="color: #0070c0;">PhD study programs</p>	
<ul style="list-style-type: none"> Ecological Sciences Physics Mathematics Technique - the education field 	

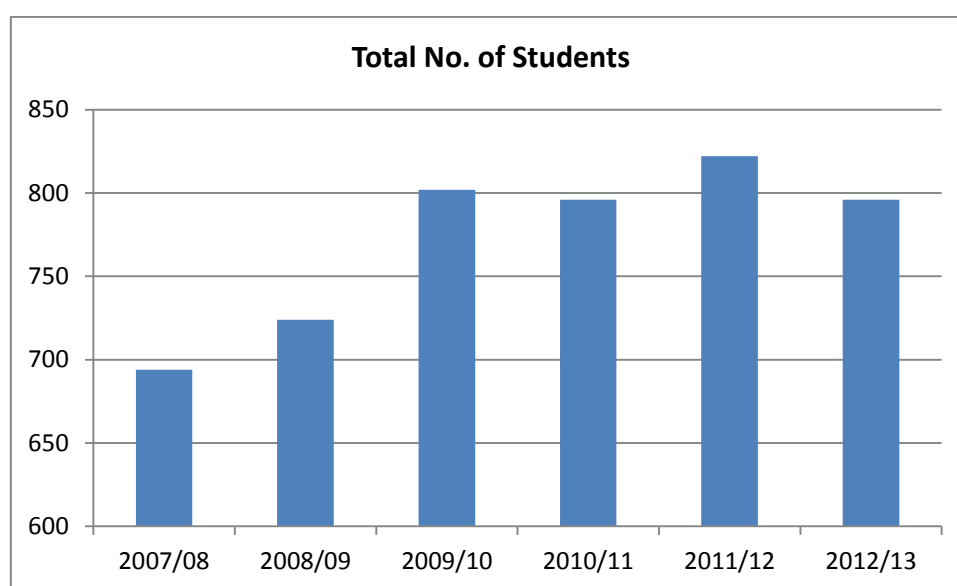
⁽¹⁾ FKKT: Faculty of Chemistry and Chemical Technology

⁽²⁾ FERI: Faculty of Electrical Engineering and Computer Science

4 Students

The number of students on different level of study programs over the years is given in table and graph below.

study year	Undergraduate programs (old 4-year programs and new 1st Bologna level)	MSc programs (new, 2nd Bologna level)	Master degree programs (old)	PhD study programs	total No. of students
2007/08	642		43	9	694
2008/09	670		38	16	724
2009/10	713		35	54	802
2010/11	723	6	6	61	796
2011/12	707	48	1	66	822
2012/13	651	100		45	796



The number of students in different study fields in study year 2012/13 (all levels)

study field	No. of students (1 st + 2 nd level)	No. of PhD students
Ecology with Nature Conservation, Biology	369,5	11
Mathematics	245,5	17
Physics	63,5	12
Pedagogical Study Programs (Chemistry, Technology)	61,5	5

4. 1 Awards

University Perlach Award for the best research work in the field of Natural Sciences and Mathematics

Asja Kamenšek (2012)

Nejc Širovnik (2011)

Matej Merhar (2010)

Maja Milfelner (2009)

Mateja Grašič (2008)

Marko Jakovac (2007)

Award of the National Bank of Slovenia for the graduation thesis

Matjaž Žunko (2011)

University programming marathon

2010, 2011, 2012: team of students of Mathematics: **Aleksander Kelenc, Tim Kos** and **Matej Kren** won the championship of the University in Maribor

Sports achievements:

The Award of Leon Štukelj for visible sport achievements

Polonca Hüll (2008)

5 Academic, Research and Administrative Staff

The table below gives the number of teaching staff (professors, assistants), technical staff and researchers and number of students in the study year 2012/13. The numbers are given in FTE (full time equivalent, since there are several employees who are employed at more than one institution, FNM being one of them). The numbers written *in italics* give the number of students per one professor, assistant, technical worker...

	Number of employees on Dec 31 2012 in FTE*	students (1st and 2nd level) without ABS** (2012/13)	students (1st and 2nd level) with ABS (2012/13)	PhD students with ABS (2012/13)	all students
		561	735	45	783
P ⁽¹⁾	25,1	<i>22,4</i>	<i>29,3</i>		<i>31,2</i>
A ⁽²⁾	19,4	<i>28,9</i>	<i>37,9</i>		<i>40,4</i>
T ⁽³⁾	8	<i>70,1</i>	<i>91,9</i>		<i>97,9</i>
R ⁽⁴⁾	14,8				

*FTE = full time equivalent

**ABS: students, who have finished the last grade but have not finished with all obligations (exams, thesis...)

(1) assistant, associate and full professors

(2) assistants

(3) technical staff

(4) researchers

The following table gives a more precise description of the job positions of the employees:

job position	Number of employees on 31 Dec 2012		Planned number of employees on 31 Dec 2013	
	Number of employees 31 Dec 2012	Number in FTE 31 Dec 2012	Number of employees 31 Dec 2012	Number in FTE 31 Dec 2012
Dean	1,0	1,0	1,0	1,0
Full professor	11,0	9,8	11,0	9,8
Associate professor	4,0	2,7	4,0	2,7
Assistant professor	13,0	12,6	13,0	13,1
total professors	28,0	25,1	28,0	25,6
Assistant with PhD	8,0	5,4	12,0	8,0
Assistant with MBS	2,0	2,0	3,0	3,0
Assistant	11,0	10,0	10,0	9,0
Teacher of skills	2,0	2,0	1,0	1,0
total teaching assistants	23,0	19,4	26,0	21,0
total academic staff	51,0	44,5	54,0	46,6
researcher (level of full professor)	2,0	2,1	2,0	2,1
researcher (level of associate professor)	0,0	0,2	0,0	0,2
researcher (level of assistant professor)	1,0	0,7	1,0	1,0
Research assistant with PhD	3,0	1,6	3,0	1,3
Research assistant with MBA	0,0	0,1	0,0	0,0
Research assistant	2,0	1,1	1,0	0,1
Young researcher	9,0	9,0	7,0	7,0
total researchers	17,0	14,8	14,0	11,7
technical staff (for support of education labs and computer centre)	10,0	10,0	9,0	9,0
administration	10,0	10,5	10,0	10,5
maintenance*	5	5,0	3	3,0
TOTAL FNM	94	84,7	91	81,8

* they are employed at FNM, but serve three faculties; their participation at FNM is 20.5%

Number of academic and research staff with respect to the research /study field at the end of 2012 is given by the following table:

study/research field	professors [FTE]	assistants [FTE]	researchers [FTE]
Physics	4,6 ⁽¹⁾	3,5 ⁽¹⁾	5,4
Biology and Nature Conservation	7 ⁽²⁾	6,5 ⁽²⁾	4,1
Mathematics	11 ⁽³⁾	6,4 ⁽³⁾	1,9
Design and Chemistry (pedagogical programs)	2,5	3	3,4
TOTAL	25,1	19,4	14,8

*they also teach Physics at study programs at Medical Faculty, Faculty of Agriculture and Life Sciences, Faculty of Health Sciences and FNM

** they also teach courses from the field of biology and ecology at Faculty of Tourism and Faculty of Agriculture and Life Sciences

***they also teach Mathematics and Statistics at study programs at Faculty of Arts, Faculty of agriculture and Life Sciences and at FNM

6 Research and development activities

Faculty of Natural Sciences and Mathematics is by its definition, vision and mission faculty at which the educational process is based on the scientific research. So we define ourselves as a research – educational faculty. Excellency in research is measured by the number and quality of the research papers, number of citations and the amount of the yearly research budget compared to the total yearly budget of the faculty.

The table below gives the research activity of the research institutes at FNM from 2008 till 2012.

Legend:

IP : Institute of Physics

IMCS: Institute of Mathematics and Computer Science

IBENC: Institute of Biology, Ecology and Nature Conservation

IMT: Institute of Modern Technologies

Z1: publications in journals with IF

A1: journals with IF in the top quarter

A2: journals with IF in the second quarter

A3: journals with IF in the third quarter

A4: journals with IF in the fourth quarter

norm. h-index: used in Slovenia by the National Research Agency in order to be able to compare different sciences

CI10: number of citations (without self-citations) in the past 10 years

2008	Z1	A1	A2	A3	A4	h-index	norm.h-index	CI 10
IP	37	27	7	1	2	17	16	1654
IMCS	35	9	14	7	5	17	25	1325
IBENC	13	2	4	4	3	8	7	213
IMT	5	1	1	0	3	9	14	200
total FNM UM	90	39	26	12	13			3392

2009	Z1	A1	A2	A3	A4	h-index	norm.h-index	CI 10
IP	36	24	9	2	1	20	17	2235
IMCS	30	2	15	9	4	18	27	1623
IBENC	5	2	1	0	2	9	7	259
IMT	3	0	2	1	0	9	14	228
total FNM UM	74	28	27	12	7			4345

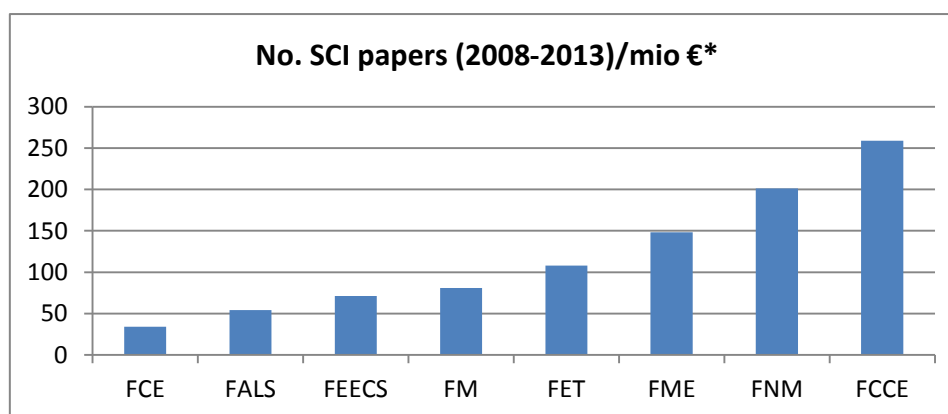
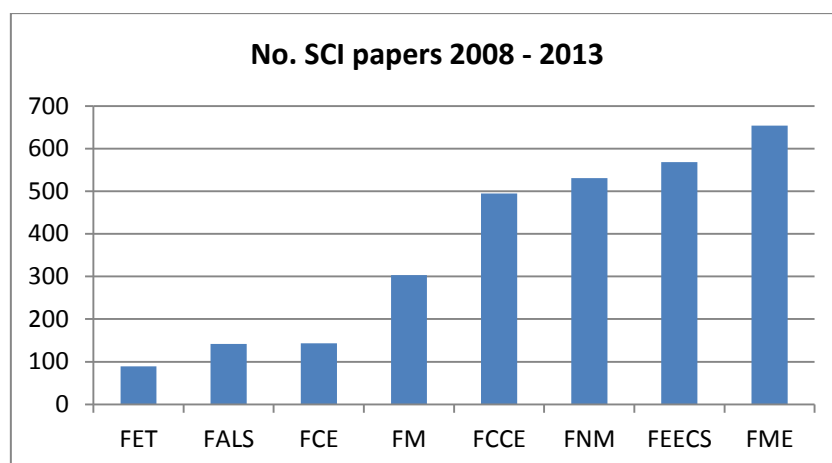
2010	Z1	A1	A2	A3	A4	h-index	norm.h-index	CI 10
IP	45	24	9	10	2	25	20	3225
IMCS	32	8	13	7	4	19	29	1960
IBENC	8	0	1	7	0	10	9	327
IMT	10	2	2	0	6	10	14	265
total FNM UM	95	34	25	24	12			5777

2011	Z1	A1	A2	A3	A4	h-index	norm.h-index	CI 10
IP	41	26	9	5	1	32	27	4626
IMCS	24	7	9	5	3	20	31	2373
IBENC	9	2	1	2	4	10	9	421
IMT	4	1	0	0	3	10	14	312
total FNM UM	78	36	19	12	11			7732

2012	Z1	A1	A2	A3	A4	h-index	norm.h-index	CI 10
IP	43	24	6	6	7	38	30	6083
IMCS	41	11	16	6	8	21	33	2749
IBENC	16	4	3	4	5	13	11	520
IMT	4	1	0	0	3	11	16	361
total FNM UM	104	40	25	16	23			9713

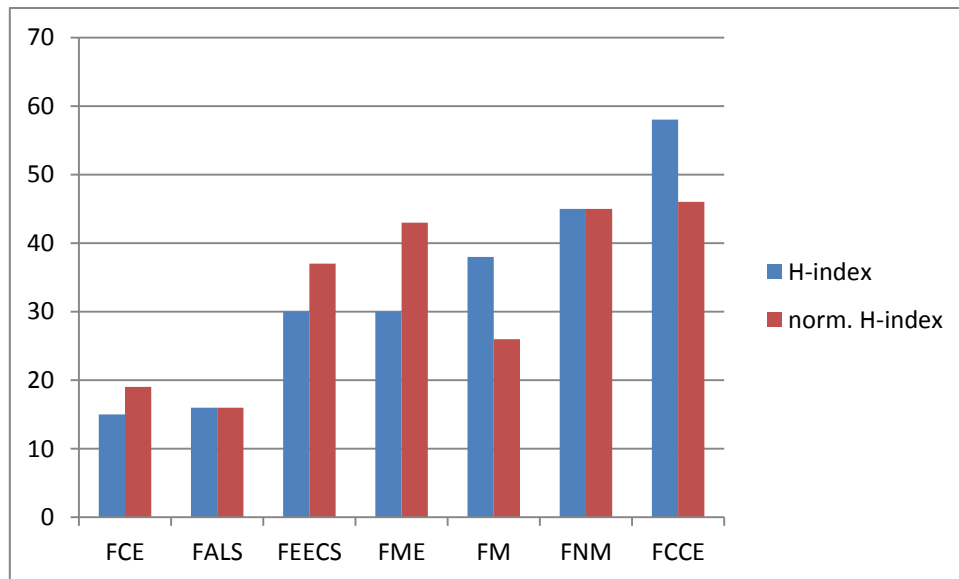
FNM UM	Z1	A1	A2	A3	A4	CI 10
2008	90	39	26	12	13	3392
2009	74	28	27	12	7	4342
2010	96	34	25	24	13	5774
2011	77	35	19	12	11	7727
2012	103	40	23	17	23	9706
total 2008-2012	440	176	120	77	67	

Comparison of FNM with other faculties from the field of natural sciences and technology (source: SICRIS, June 2013)



*financing from the Ministry of Education, Science and Sport in 2012

FCE ... Faculty of Civil Engineering	FM ... Faculty of Medicine
FALS ... Faculty of Agriculture and Life Sciences	FET ... Faculty of Energy Technology
FCCE ... Faculty of Chemistry and Chemical Engineering	FME ... Faculty of Mechanical Engineering
FEES ... Faculty of Electrical Engineering and Computer Science	



The full list of research projects is available at the faculty web-site at http://www.fnm.uni-mb.si/index.php?option=com_content&view=article&id=19&Itemid=48&lang=en

The international schools and conferences organized by the faculty since 2007:

- 10th International Symposium on Neuropterology, 2008
- Mini Conference on Continuum Theory and Dynamical Systems, 2010
- 11th European Conference on Liquid Crystals, 2011
- 3rd Slovenian Entomological Symposium with international participation, 2012
- International Scientific Conference on Philosophy of Mind and Cognitive Modelling in Education, 2012
- A Generalized Inverse Limits Day, 2012

6.1 Awards

National awards:

Zois award for the topmost achievements in science

prof. dr. Sandi Klavžar (2007)

Award of Republic of Slovenia for scientific research work

prof. dr. Matej Brešar (1995)

Award of Boris Kidrič foundation

prof. dr. Joso Vukman (1990)

The above three awards are of the same, highest level of importance in Slovenia; only the name of the reward changed during the years.

Zois award for exceptional scientific achievements

prof. dr. Valerij Romanovskij (2011)

prof. dr. Matjaž Perc (2009)
prof. dr. Sandi Klavžar (2000)

Prometheus of Science for excellency in science communication

prof. dr. Samo Kralj (2009)
doc. dr. Mitja Slavinec (2007)

editorial board of the book *Physics, my profession* (member of the board **prof. dr. Nataša Vaupotič**) (2007)

Glenn H. Brown Prize

doc. dr. Uroš Tkalec (2012)

7 International activities

International activities of FNM are very intense. They manifest themselves through the

- publications in renown international journals,
- collaboration with research institutes and universities all over the world (collaboration in projects co-authors in papers, student and staff exchange...)
- student & staff mobility,
- international research projects,
- organization of international research conferences.

Tables, figures, lists can be found at our web site <http://www.fnm.uni-mb.si/index.php?lang=en> and in the Self-evaluation report (SER) available at http://www.fnm.uni-mb.si/images/files/Samoevalvacijsko_porocilo_FNM_UM_za_letost202011_2012.pdf. Although the SER is in Slovenian language the tables can easily be understood. For tables in SER, see Sect. 2.2 International Collaboration, Sect. 3. 5. 4 Student Mobility, Sect. 4.5 Teaching Staff Mobility.

8 Material and financial conditions

8.1 Facilities

Facilities at the location Koroška 160:

- lecture halls, lecture rooms, labs, etc.	2.205,00 m ² ,
- offices	370,00 m ² ,
- administrative areas	210,00 m ² ,
- common area	2.880,00 m ² .

Rented area for offices and lecture rooms of 303,00 m² in the vicinity of the faculty (5 minute walk)

All areas can be reached by students with special needs.

8.2 ICT and research equipment of higher value

Students at FNM can use the following ICT:

- e-mail of the type name.surname@uni-mb.si,
- wireless system EDUROAM to access the internet,
- 3 computer rooms with software required by study programs,
- student server, which enables each students to prepare personal webpage. Student server offers the following services: FTP, HTTP, PHP in MYSQL,
- e-study based on Moodle,
- software MSDN-AA.

Faculty has the following contemporarily equipped labs:

- Laboratory for molecular biology,
- Microscopy rooms,
- Laboratory for Environmental Physics,
- Electrotechnical lab,
- GIS study room,
- Interdisciplinary didactical centre for environmental education,
- Virtual classroom,
- updated Computer centre with computer cluster,
- Laboratory for electrophoresis,
- Optical tweezers lab.

8.3 Library

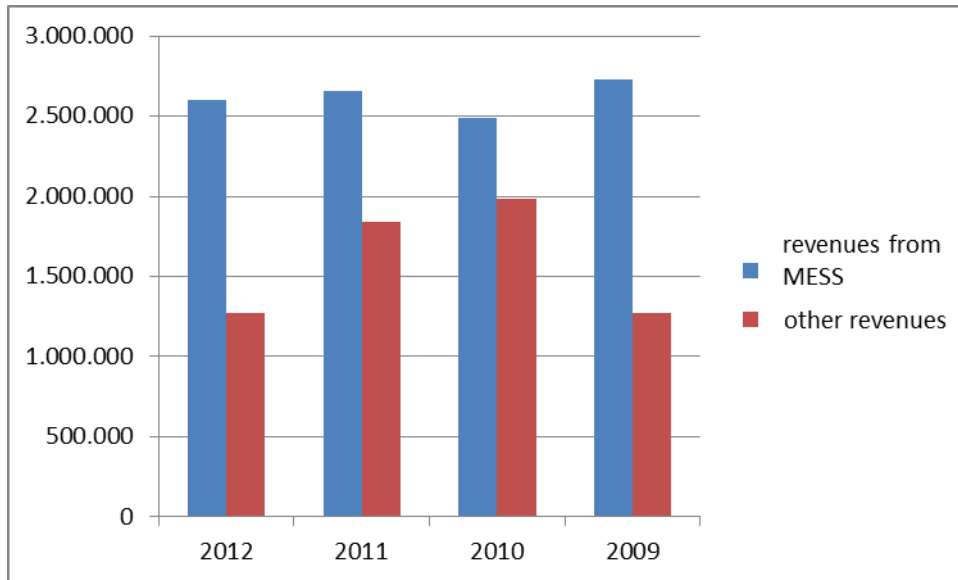
Miklošič Library – FPNM is a library of three faculties: FNM, Faculty of arts and Faculty of Education. Users can access all the elements of the library by web (acronym PEFMB, sigla 50317) <http://www.cobiss.si/scripts/cobiss?ukaz=getid&lani=si>. Since August 2012 library uses the most modern COBISS3/Cataloguing.

University of Maribor library is the central library of University of Maribor. It collects, organizes, maintains and preserves the unique written records of human thought and creativity and provides the access to them. It stimulates and supports the intellectual growth, flow of information and ideas to whole written knowledge and with that the educational, scientific, research , expert and artistic work of University of Maribor. The University of Maribor library is a guardian of cultural heritage of Slovenian nation and country, of scientific heritage of University of Maribor and of local heritage of the city of Maribor and its surroundings. It is the learning centre and with its collections and services supports the processes of education, teaching and researching of University of Maribor, intellectual personal and expert growth and long-life learning of all library users

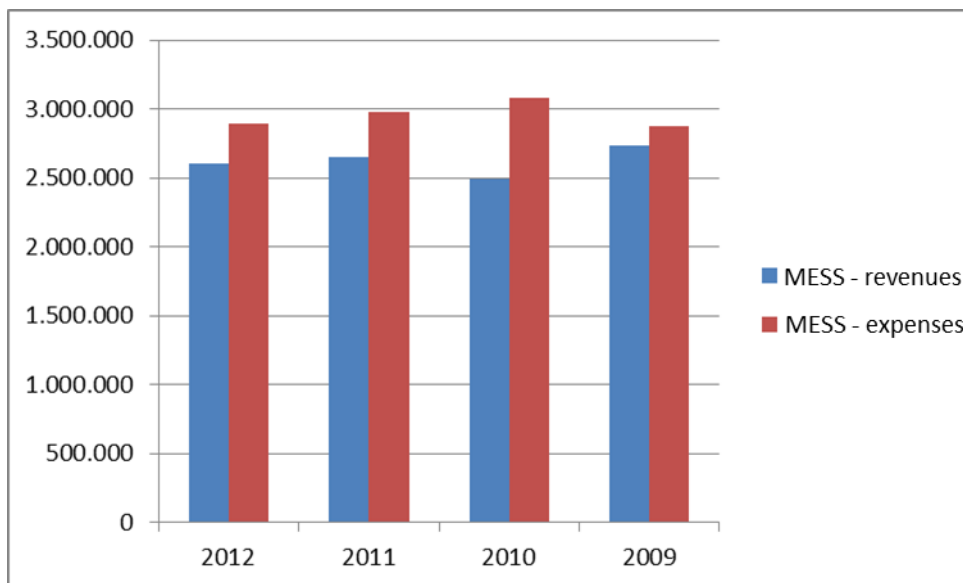
<http://www.ukm.uni-mb.si/podrocje.aspx?id=0>

8.4 Financial resources

The following graph gives the structure of financial resources. Blue columns present the system financing by the Ministry of Education, Science and Sport - **MESS** (financial resources for educational process), red columns present other financial resources (research and development projects, tuition fees for LLL programs and PhD study programs).



Slovenia does not have a law that would assure stable funding of higher education. The financial plan for achieving appropriate financing for natural sciences and Mathematics was prepared in 2005 according to the act of university funding valid at that time. After 2007 this act changed every year. As a result FNM which started by funding appropriate for social science studies has not received the appropriate long-term funding yet. Despite the extremely low number of employees who have extreme teaching loads and several other optimisation processes the faculty expenses exceed the revenues. University is solving the problem each year by reallocation of fund among faculties. In the graph below, the blue columns present the revenues and the red columns the expenses.



In years 2008 – 2012 in total **3.165.711 €** of funds (Norway grants, European Social Fund, national funds for development priorities) for development of the lab equipment for science education, development of natural science competences, development of study programs.

In years 2008 – 2012 in total **150.484 €** of funds obtained from the collaboration on research and development with companies

9 Third mission activities for sustainable development

9.1 Promotion of Science

We are very active in promoting the importance of science for **sustainable development**. We collaborate with several institutions in organization of the events, and we also prepare several events ourselves:

- organization of competitions for elementary and secondary school pupils, workshops in Physics and Technical design are organized at the faculty annually; collaboration with the *Alliance of technical culture in Slovenia*;
- organization of competition in Physics for elementary schools in collaboration with *Association of mathematicians, physicists and astronomers of Slovenia*;
- several employees are members of the national committees for the final examination before leaving the secondary school (in Mathematics, Computer Science, Informatics, Physics);
- organization of *workshops in the field of environmental education*; 12 to 14 workshops are offered each year, the last weekend in January; 500 to 600 elementary and secondary school pupils attend;
- organization of workshops for elementary school pupils (from 6 to 12 ys old) throughout the year;
- collaboration with the *Technical Museum in Bistra* in organization of the Days of Physics (one-week-long event each October);
- annual collaboration in the European event *Researchers' night* (last Friday in September);
- collaboration with all types of media (TV, radio, journals...) in promoting/explaining new scientific results;
- organization and evaluation of the research work (young researchers in elementary and secondary school).

9.2 Cooperation with Industry and other Stakeholders

We give great importance to collaborations with companies, municipalities, schools, institutes, universities, etc. in the region and also in whole Slovenia. Only 4 % of all university graduates in Slovenia are from the field of Natural Sciences and Mathematics, so this profile of graduates is demanded in all parts of Slovenia and companies from, e.g., west part of Slovenia, search for them also at our faculty.

The whole list of collaborations is, again, in the SER, in Sect 2.1 Collaboration and connectedness with the nearby and wider environment: universities, institutes, companies, schools.

9.3 Career Centre

The Career Centre FNM was established in 2010. In 2011 the Career Centre of the University of Maribor was established. Numerous joint projects are performed each year and they are listed in Sect. 2.3.1 of SER. If required, we will translate the titles of the workshops and other activities.

9.4 LLL Centre

The LLL Centre has been active since the establishment of the faculty. 2 study programs which have national accreditation are performed each year. In addition we perform several workshops for teachers of Natural Science subjects and Mathematics, the topics of the programs usually being commissioned by the Ministry of Education, Science and Sports.

9.5 ALUMNI Club

ALUMNI club FNM was established in 2008 with the first meeting in March 2008. Two additional meetings followed in 2009 and 2010. In 2010 it was decided that it would be better if the meetings were every 3 or 5 years. This year (in 2013) a society of students of FNM was established and students have decided to take over the organization of the ALUMNI meetings, the next one is planned for 2014.

10 Publishing activity

So far FNM has published 15 books, lecture books and monographs:

1. Tina Klenovšek in Saša Lipovšek, 2013, Kompendij z navodili za vaje za študijski program Biologija. FNM. Maribor.
2. Tina Klenovšek in Saša Lipovšek, 2013, Kompendij z navodili za vaje za študijski program Izobraževalna biologija. FNM. Maribor.
3. Dušan Devetak in Vesna Klokočovnik, 2012, Praktikum iz zoologije nevretenčarjev. FNM. Maribor.
4. Zlatko Golob, 2011, Funkcionalna anatomija ptičev z osnovami ornitologije. FNM. Maribor.
5. Kristijan Breznik in Janko Marovt, 2011, Praktikum iz poslovno-finančne matematike. FNM. Maribor.
6. Dušan Devetak, Saša Lipovšek in Amy E. Arnett (ur.), 2010, Proceedings of the Tenth International Symposium on Neuropterology. FNM. Maribor.
7. Lovrenc Lipej, Mitja Kaligarič in Nataša Pipenbaher, 2007, Živi svet porečja Dragonje. FNM. Maribor.
8. Robert Repnik in Ivan Gerlič, 2011, Didaktični vidiki vnašanja sodobnih znanstvenih dognanj v osnovnošolski pouk fizike. FNM. Maribor.
9. Samo Kralj in drugi, 2011, Človek, narava, znanje, razvoj. FNM. Maribor.
10. Janez Žerovnik (ur.) in Igor Pesek (ur.), 2011, Razvijanje naravoslovnih kompetenc z uporabo matematike. FNM. Maribor.
11. Vladimir Grubelnik (ur.), 2011, Strategije poučevanja za razvoj naravoslovnih kompetenc. FNM. Maribor.
12. Vladimir Grubelnik (ur.), 2011, Razvoj naravoslovnih kompetenc, Izbrana gradiva projekta. FNM. Maribor.
13. Darinka Sikošek, Iris Čelofiga Petrović, 2011, Razvoj naravoslovnih kompetenc ob delu z laboratorijskimi napravami. FNM. Maribor.
14. Vladimir Grubelnik (ur.), 2010, Opredelitev naravoslovnih kompetenc. FNM. Maribor.

15. Vesna Ferik Savec (ur.), 2010, Projektno učno delo pri učenju naravoslovnih vsebin, gradivo za učitelje. FNM. Maribor.