



UNIVERSITY OF ZAGREB FACULTY OF GRAPHIC ARTS

REACCREDITATION OF THE POSTGRADUATE UNIVERSITY PROGRAMME:

Graphic Engineering and Graphic Design

April 2016

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# I General information and conditions of delivery

Name of the study programme: Graphic Engineering and Graphic Product Design

Issuing institution: University of Zagreb Faculty of Graphic Arts

Education provider: Faculty of Graphic Arts

Scientific area and field: Engineering sciences, Graphic Technology

Place of delivery: Zagreb

Number of doctoral candidates: 61 (of which 13 inactive)

Number of teachers: 38

Number of supervisors: 20

Conditions of delivery:

Minimal legal conditions:	YES/NO Notes
1. Higher education institution (HEI) is listed in the Register of Scientific Organisations in the scientific area of the programme, and has a positive reaccreditation decision on performing higher education activities and scientific activity.	YES Statement from the Register HEI 30 Sept 2002 – Annex 1 Statement from the Register of Scientific Organisations – Annex 2 Licence to carry out the newly devised doctoral program Licence to carry out doctoral program 1 Feb 2000 – Annex 3 Ministry of Science - Licence to carry out the doctoral programme 3 Oct 2007 – Annex 4
2. HEI delivers programmes in the two cycles leading to the doctoral programme, i.e., first two cycles in the same area and field/fields (for interdisciplinary programmes), and employs a sufficient number of teachers as defined by Article 6 of the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10).	YES Faculty of Graphic Arts delivers undergraduate and graduate programmes leading to doctoral programmes in the same area (engineering sciences) and field (graphic technology).  Licence to carry out undergraduate and graduate programmes – Annexes 5a and 5b.  Accreditation recommendation ASHE – Annex 6 In accordance with Article 6 of the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions minimal legal number of teaching staff with

	<p>scientific- teaching titles employed full time is 5  <a href="http://narodne-novine.nn.hr/clanci/sluzbeni/2010_02_24_575.html">http://narodne-novine.nn.hr/clanci/sluzbeni/2010_02_24_575.html</a>  Faculty of Graphic Arts employs a sufficient number of teaching staff to carry out the doctoral programme  Number of teaching staff per academic year:  2010/2011 to 201/2013 – 30  2013/2014 to 2014/2015 - 27  The data is taken from Annual reports Of the University of Zagreb (Faculty Library)  In the academic year 2015/2016 29 members of the Faculty of Graphic Arts teaching staff is engaged in the postgraduate program.</p>
<p>HEI employs a sufficient number of researchers, as defined by Article 7 of the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Scientific Activity Re-Accreditation of Scientific Institutions (OG 83/2010).</p>	<p>YES  In accordance with Article 7 of the Ordinance on the Content of Licence and Conditions for Issuing a Licence for Performing Scientific Activity Re-Accreditation of Scientific Institutions, minimal legal number of employed researches is 15, of which 5 employed full time in the scientific field in which the scientific institution performs scientific activity  <a href="http://narodne-novine.nn.hr/clanci/sluzbeni/2010_07_83_2375.html">http://narodne-novine.nn.hr/clanci/sluzbeni/2010_07_83_2375.html</a>  Faculty of Graphic Arts employs a sufficient number of researches in the engineering area, field graphic technology.  The number of teaching staff with scientific- teaching titles per academic year is shown in paragraph 2. The data is taken from Annual reports Of the University of Zagreb (Faculty Library)</p>
<p>3. At least 50% of teaching as expressed in norm-hours is delivered by teachers employed at the HEI (full-time, elected into scientific-teaching titles).</p>	<p>YES  In the respective period more than 50% of teaching is performed by the teaching staff of the Faculty of Graphic Arts and according to the latest PhD curriculum 29 of 38 teachers in postgraduate programs (76,32%) are employees of the Faculty of Graphic Arts (Table 1 Teaching staff)  From 2011 to 2015 10 out of 38 teachers retired (7 full time employees of FGA and 3 external staff), their courses were taken by young assistant professors of the Faculty of Graphic Arts, and have been assigned course lecturers in the new programme of University postgraduate studies Graphic Engineering and Graphic Product Design from December 2015  <a href="http://www.grf.unizg.hr/wp-content/uploads/2013/10/Plan-i-program-PDS-studenti-2015-korigirani.pdf">http://www.grf.unizg.hr/wp-content/uploads/2013/10/Plan-i-program-PDS-studenti-2015-korigirani.pdf</a>  <a href="http://www.grf.unizg.hr/wp-content/uploads/2013/10/Plan-i-program-doktorskog-studija_ENG-1.pdf">http://www.grf.unizg.hr/wp-content/uploads/2013/10/Plan-i-program-doktorskog-studija_ENG-1.pdf</a></p>

<p>4. Student: teacher ratio at the HEI is below 30:1.</p>	<p>YES</p> <p>Student: teacher ratio at the HEI is below 30:1</p> <p>Teaching staff at the Faculty of Graphic Arts – teaching and external staff per academic year/ number of enrolled students per academic year</p> <p>2010/2011 – 69/848+69=917 69/917 1:13,2</p> <p>2011/2012 – 69/918+66=984 69/984 1:14,2</p> <p>2012/2013 – 59/859+60=919 59/919 1:15,6</p> <p>2013/2014 – 54/779+51=830 54/830 1:15,4</p> <p>2014/2015 – 53/645+45=690 53/690 1:13,0</p> <p>2015/2016 – 53/611+48=659 53/659 1:12,5</p> <p>The data is taken from Annual reports Of the University of Zagreb (Faculty Library)</p>
<p>5. HEI ensures that doctoral theses are public.</p>	<p>YES</p> <p>All documents and regulations of the Faculty of Graphic Arts are published on the faculty website</p> <p><a href="http://www.grf.unizg.hr/dokumenti-i-propisi-2/">http://www.grf.unizg.hr/dokumenti-i-propisi-2/</a></p> <p>In accordance with Article 13, paragraph 3 of the Ordinance on doctoral programmes, doctoral theses defence are public</p> <p><a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-PDS-18_11_2015.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-PDS-18_11_2015.pdf</a></p> <p>Defended doctoral theses are available in the Students Administration Office upon being accepted and prior to their defence.</p> <p><a href="http://eprints.grf.unizg.hr/cgi/search/simple?q=+Dissertation&amp; action_search=Search&amp; action_search=Search&amp; order=bytitle&amp;basic srctype=ALL&amp; satisfyall=ALL">http://eprints.grf.unizg.hr/cgi/search/simple?q=+Dissertation&amp; action_search=Search&amp; action_search=Search&amp; order=bytitle&amp;basic srctype=ALL&amp; satisfyall=ALL</a></p>
<p>6. HEI launches the procedure of revoking the academic title if it is determined that it has been attained contrary to the conditions stipulated for its attainment, by severe violation of the studying rules or based on a doctoral thesis (dissertation) that has proved to be a plagiarism or a forgery according to provisions of the statute or other enactments.</p>	<p>YES</p> <p>The Ethics Committee of the Faculty of Graphic Arts (Decision of the Faculty Council from 31 March 2008) and the Disciplinary Commission for students of the Faculty (Decision of the Faculty Council from 18 October 2010), and by the decision of the Faculty Council from 8 December 2014 permanent committees are established with the mandate until the end of academic year 2015/2016</p> <p><a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/Odluka-o-osnivanju-stalnih-povjerenstava.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/Odluka-o-osnivanju-stalnih-povjerenstava.pdf</a></p> <p>The Ethics Committee of the Faculty of Graphic Arts follows the Ethical code of the University of Zagreb</p> <p><a href="https://www.hrstud.unizg.hr/images/50014335/Eticki_kodeks-1.pdf">https://www.hrstud.unizg.hr/images/50014335/Eticki_kodeks-1.pdf</a></p> <p>as well as the Act on Scientific Activity and Higher education (OG 123/03, Article 82, paragraph 3 and 4)</p> <p><a href="http://narodne-novine.nn.hr/clanci/sluzbeni/306330.html">http://narodne-novine.nn.hr/clanci/sluzbeni/306330.html</a></p> <p>The Disciplinary Commission for students of the Faculty of Graphic arts follows the Ordinance of the Faculty of Graphic Arts on disciplinary responsibility of students</p> <p><a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/SMP_odluke_i_pravilnici_pravilnik-o-stegovnoj-odgovornosti-studenata.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/SMP_odluke_i_pravilnici_pravilnik-o-stegovnoj-odgovornosti-studenata.pdf</a></p>

<b>Additional/ recommended conditions of the ASHE Accreditation Council for passing a positive opinion</b>	YES/NO Notes
1. HEI (or HEIs in joint programmes) has at least five teachers appointed to scientific-teaching titles <b>in the field, or fields</b> relevant for the programme involved in its delivery.	YES The Faculty of Graphic Arts has 29 teachers appointed to scientific-teaching titles in the fields relevant for the programme (28 in the engineering area, field graphic technology; 1 in the interdisciplinary area, field graphic technology and information and communication sciences) involved in the delivery of the doctoral programme (Table 1 Teaching staff)
2. In the most recent reaccreditation, HEI had the standard Scientific and Professional Activity (e.g. Artistic for those in the arts field) marked as at least "partly implemented" (3).	<p>The doctoral study programme of the Faculty of Graphic Arts has not yet been in the process of Reaccreditation through ASHE.</p> <p>On 7 April 2014, the Committee for doctoral programs of the University of Zagreb issued within the Periodic internal evaluation of doctoral studies in the academic year 2012/2013, and based the submitted <u>Study for periodic internal evaluation of doctoral studies</u>, the evaluation that the doctoral study programmes at the Faculty of Graphic Arts fulfil and comply to conditions relevant for the programme involved in its delivery – Annex 7a and 7b</p> <p>The graph shown in the Reaccreditation Synthesis of ASHE carried out in academic year 2012/2013, shows that the Faculty of Graphic Arts has been accredited the following marks that represent a good foundation for a quality doctoral study programme:</p> <ol style="list-style-type: none"> <li>1. Management of HEI and quality assurance – mark 3.5–4</li> <li>2. Study programmes – mark 4</li> <li>3. Students – mark 4</li> <li>4. Teachers – mark 3.5–4</li> <li>5. Scientific and Professional Activity – mark 4</li> <li>6. International cooperation and mobility – mark 3.5</li> <li>7. Resources, Administration, Space, Equipment and Finance – mark 3.5</li> </ol> <p><a href="https://www.azvo.hr/images/stories/vrednovanja/Sinteza_2011_2012.pdf">https://www.azvo.hr/images/stories/vrednovanja/Sinteza_2011_2012.pdf</a></p>
3. The doctoral programme is aligned with the HEI's research strategy.	<p>In accordance with the <u>Strategy of scientific research</u> and the <u>Strategy of development</u>, the Faculty mission is to transfer knowledge and results of research achieved in the area of graphic technology and communications into the public and private sector, particularly in cooperation with other HEI from the region; contribute to the development of the economy and the overall development of society through innovations; further evolve as an institution of high academic standards and ethical criteria.</p> <p>In terms of research, the Faculty of Graphic Arts is undergoing significant developmental changes. These are primarily related to changes associated with the growth of knowledge that condition the development of new technologies, transformation of social and production relations as well as</p>

	<p>changes related to graphic technology. All this leads to the transformation from conventional printing technologies of print media to new ways of visual communication. Accordingly, the Faculty of Graphic Arts focuses its research and innovation potential towards extending current areas of classic graphic technology and design to the more developed segments that are becoming an important part of graphic technology – such as the areas associated with packaging, publishing, management, multimedia and web technologies.</p> <p>The doctoral studies programme through both semesters offers courses related to classic graphic technologies as well as courses related to packaging, publishing, management, and multimedia and web technologies.</p> <p>In the first semester of the doctoral study programme, which is shared by all doctoral students, students may choose between 16 courses that represent the application of basic sciences of mathematics, physics and chemistry, as well as interdisciplinary areas (Multimedia Systems, Management of market communications...).</p> <p>In the second semester students are offered two programmes. The first is Graphic Engineering with 20 courses (Graphic web technologies, Multimedia network technologies, Multimedia communications, Advanced printing systems and Presentation of information...) and the second Graphic Design with 12 courses (Design of security graphics, Communication graphics, Digital space design...)</p> <p><a href="http://www.grf.unizg.hr/wp-content/uploads/2013/10/Plan-i-program-PDS-studeni-2015-korigirani.pdf">http://www.grf.unizg.hr/wp-content/uploads/2013/10/Plan-i-program-PDS-studeni-2015-korigirani.pdf</a>  <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/Zn-strategija-GRF-18-12-13-finalno.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/Zn-strategija-GRF-18-12-13-finalno.pdf</a>  <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/Strategija-razvoja-Graf%C4%8Dkog-fakulteta.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/Strategija-razvoja-Graf%C4%8Dkog-fakulteta.pdf</a></p>
4. The candidate: supervisor ratio at the HEI is not above 3:1.	<p>In the preceding period 20 supervisors supervised the 44 doctoral students, where the student: supervisor ratio is 2.2:1. Other doctoral students were appointed study counsellors/potential supervisors leading to the thesis defence (Form dr.sc. – 04)</p> <p>The 7 retired supervisors supervised 12 doctoral students, of which 8 successfully finished their doctoral studies and 4 are pending - Annex 9a</p>

<p>5. All supervisors meet the following conditions:</p> <p>a) PhD, elected into a scientific title, holds a scientific or a scientific-teaching position and/or has at least two years of postdoctoral research experience;</p> <p>b) active researcher in the scientific area of the programme, as evidenced by publications, participation in scientific conferences and/or projects in the past five years (table 2, Supervisors and candidates);</p> <p>c) confirms feasibility of the draft research plan upon admission of the candidate (or submission of the proposal);</p> <p>d) ensures the conditions (and funding) necessary to implement the candidate's research (in line with the draft research plan) as a research project leader, co-leader, participant, collaborator or in other ways;</p> <p>e) trained for the role before assuming it (through workshops, co-supervisions etc.);</p> <p>f) received a positive opinion of the HEI on previous supervisory work.</p>	<p>YES</p> <p>a) All supervisors elected into scientific-teaching positions have at least two years of postdoctoral research experience (Faculty Registry Office Archive)</p> <p>b) All supervisors are active researchers in the scientific area of the programme, as evidenced by publications, participation in scientific conferences and/or projects in the past five years – Table 2 – link to CROSB: Information package of doctoral studies published on Faculty web page</p> <p>c) Supervisors confirm feasibility of the draft research plan upon submission of the proposal – Form PhD 01</p> <p>d) Supervisors ensure the conditions necessary to implement the candidate's research in line with the draft research plan - Form PhD 01</p> <p>e) Ten supervisors are trained for the role before assuming it through workshops and co-supervisions - Annex 9b.</p> <p>f) In its Annual Report the Commission for doctoral studies gives opinions on previous supervisory work</p>
<p>6. All teachers meet the following conditions:</p> <p>a) hold a scientific or a scientific-teaching position;</p> <p>b) active researcher, recognized in the field relevant for the course (table 1, Teachers).</p>	<p>YES</p> <p>a) All teachers hold a scientific-teaching position (Faculty Registry Office Archive)</p> <p>b) All teachers are active researcher, recognized in the field relevant for the course (<i>Information package</i>)</p>
<p>7. The supervisor normally does not participate in the assessment committees.</p>	<p>Mentors do not participate in committees, as regulated by all books of regulations concerning the doctoral study program at the Faculty of Graphic Arts, evident also from the Book of regulations on doctoral study program (in further text Book of regulations 2015), brought into accordance with the University Book of regulations on doctoral programs.</p> <p><a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-PDS-18_11_2015.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-PDS-18_11_2015.pdf</a></p> <p>Article 11, paragraph 1: supervisors do not participate in the assessment committees</p> <p>Article 12, paragraph 4: supervisors do not participate in the assessment and defence of the doctoral theses.</p>
<p>8. The programme ensures that all candidates spend at least three years doing independent research (while studying, individually, within or outside courses), which includes writing the thesis, publishing, participating in international conferences, field work, attending courses relevant for research etc.</p>	<p>YES</p> <p>The programme ensures that all candidates spend at least three years doing independent research. In the first two semesters candidates individually (or in consultation with supervisor) choose courses relevant to their future research. In accordance with Article 10 of the Ordinance 2015, the candidates receive maximum 35 ECTS credits for completed courses, which make 20% of the total</p>



	<p>number of credits. Within the framework of enrolled courses candidates may arrange with their respective professors / mentors measurements of their results which may be published in scientific journals or presented orally at international conferences (Table 2 Supervisors and candidates) the candidate is required prior to thesis defence to publish or be accepted for publication of at least 1 scientific work in journal of A category or two papers in B-class academic journals. (Article 8)</p>
<p>9. For joint programmes and doctoral schools (at the university level): cooperation between HEIs is based on adequate contracts; joint programmes are internationally recognized, and delivered in cooperation with accredited HEIs; the HEI delivers the programme within a doctoral school in line with the regulations (it is based on contracts in the case of multiple institutions, and the HEIs ensure good reaccreditation aimed at supporting the candidates); at least 80% of courses are delivered by teachers employed at HEIs within the consortium.</p>	<p>NO</p>

## II. SELF-EVALUATION BASED ON THE CRITERIA FOR ASSESSING QUALITY

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1. RESOURCES: TEACHERS, SUPERVISORS, RESEARCH CAPACITIES AND INFRASTRUCTURE	
<p>1.1. HEI is distinguished by its scientific/ artistic achievements in the discipline in which the doctoral study programme is delivered.</p>	<p>The scientific reputation of the doctoral study programme is based on the scientific reputation of supervisors and teachers/researchers, as well as alumni at the national and international level. (Table 1 and Table 2)</p> <p>The Ordinance of 14 April 2014 on additional conditions for the selection of staff in the scientific teacher positions I type at the Faculty provides high scientific quality of the teacher / supervisor at the doctoral studies programme  <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-o-dodatnim-uvjetima-za-izbor-na-GRF.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-o-dodatnim-uvjetima-za-izbor-na-GRF.pdf</a></p> <p>Pursuant to Decision of the Faculty Council from 14 July 2015, supervisor/co- supervisor should have published at least one article in an A category journal in the last five years.  <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/mentorstvo.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/mentorstvo.pdf</a></p> <p>The international recognition of the doctoral study programme is reflected through the mobility and exchange of teachers and the numerous international treaties and agreements on cooperation. During the academic years 2010/2011 through 2013/2014 The Faculty of Graphic Arts had signed an Erasmus cooperation agreement with 21 institutions of similar teaching and research areas,  <a href="http://www.grf.unizg.hr/erasmus-2012-2013/">http://www.grf.unizg.hr/erasmus-2012-2013/</a></p> <p>and from academic year 2014/2015 through to 2020/2021 has signed an Erasmus cooperation agreement with 22 institutions of similar teaching and research areas  <a href="http://www.grf.unizg.hr/erasmus-2011-12/">http://www.grf.unizg.hr/erasmus-2011-12/</a></p> <p>In the past 5 years through professional training the following programmes were realized:</p> <ul style="list-style-type: none"> <li>- Agreement on cooperation (56)</li> <li>- Guest lecturer (19)</li> <li>- Conference (75)</li> <li>- Other (31)</li> <li>- Project Meeting (46)</li> </ul>

- Training residence (68)

- Research residence (46)

<http://www.unizg.hr/medjunarodna/>; <http://www.grf.unizg.hr/medjunarodna-suradnja/>; <http://www.grf.unizg.hr/arhiva-erasmus-program-2010-2014/>; <http://www.grf.unizg.hr/studenti-nastavno-administrativno-osoblje/>

Teachers are involved in international projects that are based on the research of new materials and processes, such as research in the infrared range of the spectrum (applications of infrared design in security printing and graphic design) as well as the work of a multidisciplinary group, which seeks to develop new services for people with complex communication needs.

The research also aims to develop environmentally sustainable cellulose-based and biopolymer-based packaging material; it investigates the (health) safety of recycled paper and cardboard coming in contact with food; focuses on developing active and intelligent paper and cardboard packaging and new graphic applications using thermochromic inks.

In the before mentioned period Faculty employees participated in:

4 international multilateral projects (COST)

5 international bilateral projects

1 project funded by the Fund for investment in science - IPA project

1 project funded by the Creative Europe Fund (IPIP)

[http://projects.unizg.hr/projekti? v1=nd5T6KmnKW0Z5Y-9QA1HHTMMCEvBk0lr7fMx13Sr1mCajXyCIEiCcFBaUfL-nlbT9Tqbs\\_eX00pU-EvtdG9ZnkI0CtA85EKIXv5G5u3q9Nu14NRRLK\\_IOxx5tESLGwidSol8w%3D%3D& lid=10647& add=POST#proj\\_10647](http://projects.unizg.hr/projekti? v1=nd5T6KmnKW0Z5Y-9QA1HHTMMCEvBk0lr7fMx13Sr1mCajXyCIEiCcFBaUfL-nlbT9Tqbs_eX00pU-EvtdG9ZnkI0CtA85EKIXv5G5u3q9Nu14NRRLK_IOxx5tESLGwidSol8w%3D%3D& lid=10647& add=POST#proj_10647)

15 financial grants for scientific research - University of Zagreb:

6 scientific grants in 2015 - included 42 scientists from all Faculty departments and three researchers from the Faculty of Electrical Engineering and Computing

5 scientific grants in 2014 - included 29 scientists from all Faculty departments

4 scientific grants in 2013 - included 20 scientists from all Faculty departments

8 scientific research projects (Z-projects) financed by the Ministry of Science, Education and Sports since 1990 and ending with the year 2013. - Annex 8

Beginning of 2012, the staff of the Faculty became involved in the work of the Centre of Excellence for Computer Vision at the University of Zagreb

<http://www.grf.unizg.hr/fond-za-razvoj/>

	<p>In addition to regular calls for tenders for mobility through the Erasmus +, regularly published are calls for tenders for STSM scholarships i.e. Short Term Scientific Mission within the framework of the COST projects and activities of the International Association EFPRO involving representatives of the Faculty of Graphic Arts, mostly young scientists - PhD students; as well as calls for training of young scientists through organized scientific workshops (e.g. COST Training School).</p> <p>One postgraduate student participated from 25.August to 8.September 2012 in a training and research program at the "Papiertechnische Stiftung" – PTS in Heidenau/Dresden, in the framework of a STSM grant, financed by EFRO.</p> <p>In the period from 13 – 17 July 2015 1 PhD student participated at COST summer school held at the Swansea University, Welsh Centre for Printing and Coating</p> <p>In 2013 Two Faculty employees took part in a training program in the framework of COST FP 1003 (BioMatPAck Winter Training School – „Use of nanopolysaccharides in packaging“) at the INP-Pagora Institute in Grenoble, France.</p> <p>In 2014 Four teachers participated in a training program in the framework of COST FP 1003 (BioMatPAck Autumn Training School – „Innovation Management“) at the ITENE Institute in Valencia, Spain.</p> <p>One postgraduate student participated from 1.December 2012 to 1.March 2013 in a training and research program at the National Institute of Chemistry in Ljubljana (grant provided by the Republic of Slovenia with the purpose of conducting doctoral research). In the academic year 2014/15.the Faculty of Graphic Arts organised the Project Meeting COST FP1104 in Zagreb with 10 employees of the Faculty participating.</p> <p>Within the CEEPUS network CIII-RS-0704-03-1415 Research and Education in the Field of Graphic Engineering and Design, in AY 2014/2015 following lecturers gave lectures:  Jan Wallis and Bohumil Jašurek - University of Pardubice Department of Graphic Arts and PHOTOPHYSICS, Faculty of Chemical Technology Czech Republic  Rozália Szentgyörgyvölgyi - Óbuda University, Budapest Rejto Sándor Faculty of Light Industry Engineering Hungary  Borislav Malinović -University of Banja Luka, Faculty of Technology  Ivana Jurić - University of Novi Sad, Faculty of Technical Sciences, Department of Graphic Engineering and Design</p> <p>Representatives of the faculty in international organizations:  Prof. Ph. D. Branka Lozo – EFPRO, member of Management Board  Assoc. prof. Ph. D. Vesna Džimbeg Malčić - IARIGAI  Prof. Ph. D. Branka Lozo - The Secretary General of the International Association IARIGAI</p> <p>The international recognition of teachers of doctoral studies may be monitored through active participation in nine international</p>
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	<p>associations and committees.  (PIA (Printing Industries of America); PIRA (Smithers Printing Industry Research Association), TAPPI (Technical Association of the Pulp and Paper Industry); IS &amp; T (The Society for Imaging Science and Technology TAGA (Technical Association of the Graphic Arts), FOGRA (Fogra Graphic Technology Research Association) UPA (Usability Professionals Association); IARIGAI (The International Association of Research Organizations for the Information, Media and Graphic Arts Industries); GATF (Graphic Arts Technical Foundation) / GAIN (2012 and 2011))</p> <p>The study program is closely connected with related colleges of the eminent <i>International Circle of Educational Institutes for Graphic Arts, Technology and Management</i>, which ensures a continuous assessment of study programs and teaching process of institutions with a similar profile.</p> <p>The Faculty of Graphic Arts organizes:  The International Conference on Printing, Design and Graphic Communications - Blaž Baromić,</p> <p>And is co-organizer of:  The International Scientific Conference Printing &amp; Design  The International Scientific Conference MATRIB  The International Colour Day organized by HUBO</p> <p>Full professor Branka Lozo served in 2014 as General Chair of the NIP/Digital Fabrication International Congress in Philadelphia, Pennsylvania; in 2013 she served as Publication Chair in Seattle, Washington, and she was awarded for her roles by the organizer IS&amp;T (The Society for Imaging Science and Technology) in 2015 in Portland, Oregon. <a href="http://www.imaging.org">www.imaging.org</a></p> <p>The Faculty of Graphic Arts regularly publishes an academic journal of printing and graphic communication <i>Acta Graphica</i>, cited in the DOAJ, EBSCO, HRČAK, I2OR, OAJI databases. The journal is in English and is published quarterly in printed and electronic form <a href="http://www.actagraphica.hr/index.php/actagraphica">http://www.actagraphica.hr/index.php/actagraphica</a></p> <p>Full professor Branka Lozo is a guest editor of the Journal of Imaging Science and Technology, JIST, <a href="http://www.imaging.org">www.imaging.org</a></p> <p>Faculty of Graphic Arts published the monograph marking the 50th anniversary Faculty of Graphic Arts. <a href="http://www.grf.unizg.hr/wp-content/uploads/2013/01/monografija_monografija_grf_lq.pdf">http://www.grf.unizg.hr/wp-content/uploads/2013/01/monografija_monografija_grf_lq.pdf</a></p>
1.2. The number and workload of teachers involved in the study programme ensure quality doctoral education.	30 of a total of 38 teachers involved in the study programme (80%) are employees of the Faculty of Graphic Arts and the total teaching workload is in accordance with the norm (Table 1 Teaching staff)
1.3. The teachers are highly qualified researchers who actively engage with the topics they teach,	The teaching staff at the doctoral studies are highly qualified scientists and have in the past 5 years published 269 scientific publications relevant for the programme area and field. (Table 1)

providing a quality doctoral programme.	
1.4. The number of supervisors and their qualifications provide for quality in producing the doctoral thesis.	<p>Of 20 supervisors, 13 are full time employees and 7 are recently retired. On recommendation of Faculty Commission and by the decision of the Faculty Council from November 16<sup>th</sup> 2015 new course lecturers have been appointed.</p> <p>Full time employed supervisors supervise 31 candidates of which 22 have completed their doctoral studies and the remaining 9 are in the process of finishing their studies. 5 supervisors successfully supervised 7 doctoral theses, and the remaining 15 doctoral theses have been completed with 7 other supervisors. 8 supervisors have 10 doctoral theses in the process of completion.</p> <p>The retired supervisors have 8 candidates who completed their theses and another 4 candidates are in the process. (Annex 9a)</p>
1.5. The HEI has developed methods of assessing the qualifications and competencies of teachers and supervisors.	<p>The Faculty has developed formal mechanisms of assessing and monitoring the qualifications and competencies of teachers and mentors.</p> <p>Respective teachers are obliged to present their CV's and a description of their course programme as well as works that qualify him/her to carry out the course. The request is sent to the Faculty Commission for doctoral studies who then passes the request to the Faculty Council for approval.</p> <p>Teachers/supervisors further develop their competencies and qualifications by attending workshops for teachers/supervisors (Annex 9b), as defined in the <a href="#">additional conditions</a> or appointment and service for academic staff</p> <p>Students assess the qualifications of supervisors through Form PhD 04 that they submit through OBAD.</p> <p>Amendments to the Ordinance on doctoral studies are in the process and they are to regulate the responsibilities of all teachers on the doctoral study programme to complete the workshop for teachers/supervisors.</p>
1.6. The HEI has access to high-quality resources for research, as required by the programme discipline.	<p>The Faculty of Graphic Arts provides the candidates with modern equipment and laboratories, quality library resources. The catalogue of resources is available on faculty website: <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/SMP_KatalogOpreme_FINAL-WEB_v2.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/SMP_KatalogOpreme_FINAL-WEB_v2.pdf</a></p> <p>The Faculty Library (Annex 10) provides the following resources:</p> <p>Journals – the Faculty has 41 subscriptions to relevant journals and is member of 10 international scientific organisations.</p> <p>Access to databases</p> <p>Portal of electronic sources for the Croatian academic and scientific community <a href="http://baze.nsk.hr/">http://baze.nsk.hr/</a></p> <p>Library books:</p> <p>New books acquired from 2011 to 2015 – 1190 publications</p> <p>For purposes of scientific research from 2011 to 2015 – 409 publications</p> <p>For teaching purposes from 2011 to 2015 – 781 publications</p> <p>The Library holds around 8000 books</p> <p>The Faculty has its own repository (<a href="http://eprints.grf.unizg.hr/">http://eprints.grf.unizg.hr/</a>), digital collection that brings together bibliographic information and full versions of doctoral, master's, diploma and final works which authors are the employees / students of the Faculty of Graphic Arts, and which are stored in the Faculty Library.</p> <p>From 2011 to 2015 there have been 1227 works deposited in the Library. The Library provides access to 4 computers for students and doctoral candidates.</p> <p>The following <a href="#">programs</a> are made available for students free of charge.</p>

<b>2. INTERNAL QUALITY ASSURANCE OF THE PROGRAMME</b>	
<p>2.1. The HEI has established and accepted effective procedures for proposing, approving and delivering doctoral education. The procedures include identification of scientific/ artistic, cultural, social and economic needs.</p>	<p>The Faculty received its licence for the first University postgraduate scientific study "Graphic engineering" on 1 February 2000 (Annex 3). On 3 October 2007 the Ministry of science, education and sport issued a licence for the University postgraduate study "Graphic engineering and Graphic product design" (Annex 4), the only such programme in Croatia and the oldest in the region. Doctoral programme is designed to interconnect scientific research with practical experience in the field of graphic engineering and graphic product design (Study for periodic internal evaluation of doctoral studies at the University of Zagreb, academic year 2012/13, the Ordinances for doctoral studies). The purpose of the programme is to train doctoral candidates for independent scientific research. The management of basic, applied and interdisciplinary research are in accordance with the international standards as recommended by the EUA-European University Association (Salzburg II Recommendations, 2010). By including doctoral candidates from industry to the doctoral programme allows for the gradual establishment of research and development units for monitoring the printing industry, creative industries and the public sector, with the aim of socio-economic development and of creating a strategic partnership between the Faculty, the University and the business sector. The doctoral programme comprises interdisciplinary studies. Acquired competences allow doctoral candidates to continue their scientific research work and enable them to be involved in national and international projects and give them the possibility of postdoctoral training abroad. The employment of doctoral candidates in small companies is limited, but there is an increased demand for their employment in large and specialized graphic companies and in public and education sectors.</p> <p>The research activity of this kind indirectly generates new business and workplaces - food industry, pharmaceutical, confectionery industry: application of printing techniques on graphic materials and their impact on human health and the environment, the application of infrared designs in security printing and graphic design, which seeks to help the development of knowledge-based economy.</p>
<p>2.2. The programme is aligned with the HEI research mission and vision, i.e. research strategy.</p>	<p>The doctoral programme is in agreement with the Strategy of scientific research 2014-2020 and with the Development strategy 2011-2016. The Faculty implements the transfer of knowledge and results of research in the field of graphic engineering, graphic design, and other interdisciplinary activities related to the scientific field of graphic technology to the private and public sector, in collaboration with other higher education institutions from the region. The Faculty follows contemporary European trends and adapts to market needs. The fundamental task of the doctoral studies programme is to develop the economy through innovation, to contribute to the overall development of society on the basis of high academic value and ethical criteria. The competitiveness of the doctoral programme in the European Research Area is achieved by organizing and carrying out various bilateral and multilateral projects. The vision of the Faculty is to apply the latest knowledge and standards in education and to transfer the same into the public and private sector.</p> <p>In terms of research the Faculty is going through significant developmental changes related to the transformation of conventional printing technologies of print media to new ways of visual communications. Furthermore, research and innovation potentials are focused on new areas that are interacting with new materials and technologies, packaging, publishing, management, multimedia and web technologies. The section of graphic design is directed to the development of systematic and formalized methodologies relevant to the specific design practices. For the purposes of structuring research activities new research laboratories have been established</p>

	<p>(Ordinance on research laboratories). A multidisciplinary approach to research (Information Package) is provided by the involvement in the competence networks with national and international research institutions (University of Zagreb – Faculty of Electrical Engineering and Computing, Faculty of Education and Rehabilitation Sciences, Faculty of Humanities and Social Sciences, Ruder Bošković Institute, Faculty of Chemical Engineering and Technology, Faculty of Textile Technology; Faculty of Natural Sciences and Engineering -University of Ljubljana, Chemical Institute in Ljubljana, Institute for cellulose in Ljubljana, Stuttgart Media University), by encouraging interdisciplinary projects in the areas of creative industries, art and photography, ICT technology, web design and graphic technology - IPIP, IPA, COST, EFPRO, IARIGAI, project ICT-AAC, SuZ-financial support (Table Project). The level of scientific activity is developed in the areas of scientific research projects, projects for cooperation and exchange of researchers, and multinational research projects. Research within scientific projects contributes to the overall activities of the Faculty as it includes all of the potential of Faculty staff - including young researchers. The most significant outcome of research is publications of research papers in scientific journals and international congresses, which directly enable the exchange of knowledge and the establishment of and the planning of future scientific cooperation and working visits (Table 1 and 2).</p>
<p>2.3. The HEI systematically monitors the success of the programmes through periodic reviews, and implements improvements.</p>	<p>The Faculty has established mechanisms for periodically reviewing the quality of the doctoral programme. The Annual report of the Commission and the Commission for quality management (CQM) ensures the assessment of the success of the programme on all levels. International / national programme reviews have been carried out by the University of Zagreb – the Committee for doctoral studies (The opinion of the Committee for doctoral programmes 2014/15). The doctoral study is organized and carried out according to the programme for each course individually (<a href="http://www.grf.unizg.hr/plan-i-program-doktorskog-studija-2">http://www.grf.unizg.hr/plan-i-program-doktorskog-studija-2</a>).</p> <p>The scientific productivity of supervisors and doctoral candidate is periodically monitored (ASHE Table 2), as well as annually through Annual reports on the activities of supervisors and doctoral candidates (Form PhD 04 and 05)</p> <p>The feedback from candidates concerning the supervision system and the support provided by the Faculty is positive according to the Analysis of periodic internal evaluation for academic year 2012/2013. The students are satisfied with the availability of their supervisors as evidenced by OBAD Form PhD 04. The number of doctoral candidates per supervisor is limited to no more than two at a time according to the decision of the Faculty Council of February 14, 2011. The Faculty Management organizes periodic meetings - "round tables" (Intergrafika, B. Baromić, Printing and Design, MATRIB) with external stakeholders and members of the business sector which enables further assessment of the quality of the doctoral studies.</p>
<p>2.4. HEI continuously monitors supervisors' performance and has mechanisms for evaluating supervisors, and, if necessary, changing them and mediating between the supervisors and the candidates.</p>	<p>On the proposal of doctoral candidates and with the agreement of the prospective supervisor, the Commission for doctoral studies and science appoints the doctoral supervisor. If the prospective supervisor is not determined on enrolment, the Commission assigns the doctoral candidate a study counsellor. In order to ensure the quality of the doctoral studies, double supervision must be enabled if the need arises (interdisciplinary research, carrying out research in more than one institution). The supervisor must be appointed at least in the academic title of assistant professor or research associate. The supervisor may be head of or member of the scientific research project, or respectively an active member in the field of research of the doctoral thesis. Before taking up the first supervision, the supervisor needs to pass a workshop for supervisors organized by the University of Zagreb. The supervisor is required to submit an annual report on the work of the doctoral candidate using the University Form (Form PhD 05) and present the candidates scientific</p>



	<p>success (Table 2). The quality of the doctoral candidate is assessed by the number of papers published with the supervisor and with teachers whose courses the candidate enrolled (scientific symposiums, training at international institutions). The supervisor(s) is obliged to guide doctoral candidates through the PhD thesis, to monitor the quality of the candidates work, encourage the publication of his/her works and enable participation in research projects. The supervisors are rewarded according to the Decision on financing after the doctoral candidate completes doctoral studies. On the proposal of the Commission the Faculty Council may decide to rescind the doctoral candidates rights to continue their studies if the quality of the candidate is not satisfactory or in accordance with the Code of Ethics of the University of Zagreb. The Faculty has established mechanisms and documents necessary to change the candidates' supervisor (Form PhD 06) and to mediate between the supervisors and the candidate if necessary in accordance with the Ordinance on doctoral studies.</p> <p>Two professors (L. Mandić and J. Pibernik) and the PhD candidate J. Dolić are members of a team of scientists and experts, the ICT-AAC project team, awarded the annual reward for lifetime achievements in the field of education.</p> <p><i>"Ivan Filipović" awards for the year 2014</i></p> <p>At the 13<sup>th</sup> International Innovation Exhibition AMCA 2015 PhD student Filip Cvitić, in collaboration with his mentors J. Pibernik and M. O. Pavčević, was awarded a bronze plaque for his innovation "MM code", based on the results of his doctoral thesis.</p>
<p>2.5. HEI assures academic integrity and freedom.</p>	<p>The Faculty has procedures that assure academic integrity (The stages of the application process of the doctoral thesis to its defence). The Faculty formed the Ethics Committee in accordance with the ordinance of Code of Ethics of the University of Zagreb. Preventing plagiarism and unethical behaviour of candidates is provided as follows:</p> <ul style="list-style-type: none"> <li>- the Faculty Council confirms the composition of the expert committee (one external member) for the defence of the doctoral thesis, the report of the public defence of the thesis is approved by the Faculty Council and the Council for technical areas;</li> <li>- the Faculty Council confirms the composition of the expert committee (one external member) for the assessment of the doctoral thesis; positively evaluated doctoral thesis is publicly presented and published on the Faculty website, the report is approved by the Faculty Council and passed to the Senate of the University of Zagreb.</li> </ul> <p>Any form of forgery and plagiarism is considered a breach of the Code of Ethics. Faculty members must guarantee the authenticity of the published scientific papers, attributed to them, and the accuracy and honesty in the presentation of information on the origin of ideas and arguments that have been used in the work.</p>
<p>2.6. The process of developing and defending the thesis proposal is transparent and objective, and includes a public presentation.</p>	<p>To begin the process of developing the thesis proposal the doctoral candidate must have earned at least 15 ECTS credits (Ordinance 2015). Candidate's supervisor proposes to the Faculty Council the initial proceedings for the application of doctoral thesis (Form PhD 01) and the appointment of members of the Commission for acceptance / evaluation of the doctoral thesis (Form PDS 01). The defence of the doctoral thesis is held not earlier than 7 days and no later than three months after the meeting of the Faculty Council where the specially appointed evaluating committee. After defending the thesis, the Commission will submit a report on the evaluation of the doctoral work (Form PhD 02). The supervisor proposes to the Faculty Council the acceptance of the thesis topic and approval for writing the doctoral thesis. Following the decision of the Faculty Council on accepting the thesis topic and approval of writing the</p>

	<p>doctoral thesis, the head of the Student Administration Office delivers a decision on approval of the doctoral thesis (PhD 03) to the Dean of the Faculty. The decision of the Faculty Council of the acceptance of doctoral thesis topic (with annex Forms PhD 01, PhD 02, PhD 03) shall be submitted to the Technical Field Council for approval of the topic for the doctoral degree. The expert committee for the defence of doctoral thesis must include at least one member from other institutions (universities, institutes). Forms PDS 01-04 are publicly available on the website of the Faculty.</p>
<p>2.7. Thesis assessment results from a scientifically sound assessment of an independent committee.</p>	<p>The completion of doctoral education begins with thesis assessment. Doctoral candidate delivers the thesis along with the supervisors' written consent and review of the completed research and achieved original scientific contribution to the registry office of the Faculty when the candidate has at least 180 ECTS credits and has paid full tuition fees. Before the assessment procedure it is necessary to determine whether the candidate has fulfilled all his/her obligations provided in the study programme (passed all exams enrolled in I and II. Semester, enrolled in all semesters of scientific research and other anticipated liabilities). The Faculty Council appoints the assessment committee for the thesis defence. The assessment committee shall within 2 (two) months of its appointment provide a written report with the assessment of the thesis. The doctoral candidate may defend the thesis after the Faculty Council accepts positive assessment of the committee for the thesis, but no later than 2 (two) months. The proceedings of thesis defence are recorded in writing in the Croatian language, in case of thesis defence in English the written recording shall be made available in English language as well in which case the doctoral candidate shall bear the cost of certified translator.</p> <p>The Ordinance on doctoral studies lists the procedures of producing, assessing and defending the thesis. The supervisor may not be a member of the Expert Committee. External/international examiners participate in the assessment and defence of all doctoral theses, as described in the Ordinance on doctoral study. Written records of thesis defence are publicly available (Student Registry of the Faculty). The Faculty encourages candidates to have at least one publication in an internationally competitive peer-review publication in the field of the thesis, prior to the assessment of doctoral thesis (Table 2 Teachers) as described in the Ordinance on doctoral study. The Faculty also encourages the participation of external / international members of the faculty or institute in publishing scientific papers: Modrić-Hladnik Lozo-Munck, Brozović-Možina.</p>
<p>2.8. The HEI publishes all necessary information on the study programme, admissions, delivery and conditions for progression and completion, in accessible outlets and media.</p>	<p>The official web page of the Faculty aims to inform the public on developments on the doctoral study programme. The website contains a published public application call on the terms of enrolment <a href="http://www.grf.unizg.hr/natjecaj-za-upis-na-doktorski-studij">http://www.grf.unizg.hr/natjecaj-za-upis-na-doktorski-studij</a>; an outlined programme and manner of conducting the study through institutional structure; the requirements for the completion of studies; describes the system of counselling and guidance of doctoral candidates including forms and instructions on the protocol of studies and credit system; describes the conditions for the acceptance of doctoral thesis and protocols for assessment and defence of doctoral thesis; defines the rights and obligations of doctoral candidates and supervisors and the amount of tuition fees for the current academic year. <a href="http://www.grf.unizg.hr/doktorski-studij/">http://www.grf.unizg.hr/doktorski-studij/</a> <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-PDS-18_11_2015.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/Pravilnik-PDS-18_11_2015.pdf</a></p>
<p>2.9. Funds collected for the needs of doctoral education are distributed transparently and in a way that ensures sustainability and further development of doctoral education (ensures that candidates'</p>	<p>The tuition fees are prescribed by the Decision of the Faculty Council and are in line with the tuition fees of similar doctoral studies in technical areas. According to the Contract of payment of doctoral studies of Graphic Engineering and Graphic Product Design tuition fees amount to 10,000.00 kn per semester, for a total of 6 semesters the fees amount to 60,000.00 kn. The education at the doctoral study includes the cost of using the laboratory equipment of Faculty and other institutions. The Faculty also funds the cost of</p>

<p>research is carried out and supported, so that doctoral education can be completed successfully).</p>	<p>purchasing materials for scientific research. For doctoral candidates who are employed full-time at the Faculty, and were elected to the associate title of assistant professor tuition costs are borne by the Faculty. The tuition fees of doctoral studies cover the costs of tuition, the cost of registering, assessment and defence of the thesis and costs of experimental work. The cost of making experimental work is done in agreement with the supervisor and approved by the Faculty Management. With dual doctorates and mobility according to the regulations of the University, the tuition fees are paid only at one institution. In case of quitting the studies during the course of teaching, the doctoral candidate / the depositor shall not be refunded under Article 8 of the Contract of payment of doctoral study at Faculty of Graphic Arts. In case of continuing the studies an Annex to the Contract of payment of doctoral study shall be drafted in accordance with tuition fees of generation with which the doctoral candidate continues doctoral studies.</p>																																															
<p>2.10. Tuition fees are determined on the basis of transparent criteria (and real costs of studying).</p>	<table border="1"> <thead> <tr> <th data-bbox="752 464 1391 504" rowspan="2"><i>Explanation of study costs</i></th> <th colspan="5" data-bbox="1391 504 2148 536"><i>Academic year</i></th> </tr> <tr> <th data-bbox="1391 536 1543 596"><i>2010/ 2011</i></th> <th data-bbox="1543 536 1695 596"><i>2011/ 2012</i></th> <th data-bbox="1695 536 1848 596"><i>2012/ 2013</i></th> <th data-bbox="1848 536 2000 596"><i>2013/ 2014</i></th> <th data-bbox="2000 536 2148 596"><i>2014/ 2015</i></th> </tr> </thead> <tbody> <tr> <td data-bbox="752 596 1391 628"><b><i>Funds from tuition fees</i></b></td> <td data-bbox="1391 596 1543 628"><b>297.350</b></td> <td data-bbox="1543 596 1695 628"><b>46.100</b></td> <td data-bbox="1695 596 1848 628"><b>274.210</b></td> <td data-bbox="1848 596 2000 628"><b>309.035</b></td> <td data-bbox="2000 596 2148 628"><b>235.030</b></td> </tr> <tr> <td data-bbox="752 628 1391 699"><i>Costs of research and teaching costs (Excluding teaching fees)</i></td> <td data-bbox="1391 628 1543 699">190.000</td> <td data-bbox="1543 628 1695 699">8.000</td> <td data-bbox="1695 628 1848 699">74.977</td> <td data-bbox="1848 628 2000 699">90.812</td> <td data-bbox="2000 628 2148 699">58.311</td> </tr> <tr> <td data-bbox="752 699 1391 738"><i>Costs of lecturers / researchers on the programme</i></td> <td data-bbox="1391 699 1543 738">84.908</td> <td data-bbox="1543 699 1695 738"></td> <td data-bbox="1695 699 1848 738">118.482</td> <td data-bbox="1848 699 2000 738">150.000</td> <td data-bbox="2000 699 2148 738">15.311</td> </tr> <tr> <td data-bbox="752 738 1391 809"><i>Costs of supervisor (for supervising doctoral candidates)</i></td> <td data-bbox="1391 738 1543 809">20.585</td> <td data-bbox="1543 738 1695 809">30.913</td> <td data-bbox="1695 738 1848 809">27.072</td> <td data-bbox="1848 738 2000 809">19.584</td> <td data-bbox="2000 738 2148 809"></td> </tr> <tr> <td data-bbox="752 809 1391 879"><i>Costs of external cooperation (costs and fees for external associates)</i></td> <td data-bbox="1391 809 1543 879">11.535</td> <td data-bbox="1543 809 1695 879"></td> <td data-bbox="1695 809 1848 879">1.695</td> <td data-bbox="1848 809 2000 879">25.653</td> <td data-bbox="2000 809 2148 879"></td> </tr> <tr> <td data-bbox="752 879 1391 916"><b><i>Total amount</i></b></td> <td data-bbox="1391 879 1543 916"><b>307.028</b></td> <td data-bbox="1543 879 1695 916"><b>38.913</b></td> <td data-bbox="1695 879 1848 916"><b>222.226</b></td> <td data-bbox="1848 879 2000 916"><b>286.049</b></td> <td data-bbox="2000 879 2148 916"><b>73.622</b></td> </tr> </tbody> </table>	<i>Explanation of study costs</i>	<i>Academic year</i>					<i>2010/ 2011</i>	<i>2011/ 2012</i>	<i>2012/ 2013</i>	<i>2013/ 2014</i>	<i>2014/ 2015</i>	<b><i>Funds from tuition fees</i></b>	<b>297.350</b>	<b>46.100</b>	<b>274.210</b>	<b>309.035</b>	<b>235.030</b>	<i>Costs of research and teaching costs (Excluding teaching fees)</i>	190.000	8.000	74.977	90.812	58.311	<i>Costs of lecturers / researchers on the programme</i>	84.908		118.482	150.000	15.311	<i>Costs of supervisor (for supervising doctoral candidates)</i>	20.585	30.913	27.072	19.584		<i>Costs of external cooperation (costs and fees for external associates)</i>	11.535		1.695	25.653		<b><i>Total amount</i></b>	<b>307.028</b>	<b>38.913</b>	<b>222.226</b>	<b>286.049</b>	<b>73.622</b>
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### 3. SUPPORT TO DOCTORAL CANDIDATES AND THEIR PROGRESSION

<p>3.1. The HEI establishes admission quotas with respect to its teaching and supervision capacities.</p>	<ul style="list-style-type: none"> <li>- The Faculty takes into account the number of available supervisors and their teaching workload (Table 1 Teaching staff), as defined by the respectively valid regulation. In accordance with Article 5. of the Ordinance 2015 and prior practices, the total capacity of doctoral studies (including the total number of supervisors) is determined by available research and scientific capacities of the Faculty. Furthermore, the teaching capacities of supervisors and their workload is defined by the decision of the Faculty Council of 14 February 2011, which determines the number of candidates a supervisor may supervise, with no more than 2 candidates per supervisor up to the thesis approval at the Technical Field Council. Thus ensuring that supervisors are not overloaded with an exceeding number of students, and at the same time ensuring that at the moment the thesis is defended the doctoral candidate continues scientific work and research, and the supervisor may take on a new candidate for supervision.</li> <li>- The doctoral study programme at the Faculty of Graphic Arts belongs to the scientific field of engineering sciences, the field of graphic technology – processes of graphic reproduction, the competencies and the quality of supervisors are ensured by the doctoral study programme which is designed taking into account the area of scientific research of the teaching staff, especially taking into account relevant publications of the teaching staff. Students upon enrolment of the semester may choose their desired courses and pursue their further interests thus ensuring work with competent supervisors. Another element ensuring the quality is the publication of the candidates works in A class journals. The supervisor competencies are also assured by the attendance of new supervisors at supervisor workshops, which are organized by the University and the Faculty itself. The Committee reviews all documentation and supervisor and candidate competencies before the thesis proposal reaches the Faculty Council. The Committee proposes acceptance of the proposed thesis theme while the Faculty Council retains the right to suggest changes to the proposal in order to improve quality.</li> <li>- At present there are 49 candidates at the doctoral study with 38 teachers with supervising qualifications. In addition to the already mentioned condition for admission quotas is the decision of the Faculty Council of 14 February 2011, which defines the maximum quota of candidates per supervisor and terms and conditions of taking up new candidates.</li> <li>- The obligations of supervisors and co-supervisors, candidates and research teams are clearly defined by the Ordinance of doctoral studies of the University of Zagreb, additionally defined by the Ordinance 2015 of 18 November 2015 at the Faculty of Graphic Arts.</li> </ul> <p>Call for admission with specified quotas is published on Faculty web page <a href="http://www.grf.unizg.hr/natjecaj-za-upis-na-doktorski-studij/">http://www.grf.unizg.hr/natjecaj-za-upis-na-doktorski-studij/</a></p>
<p>3.2. The HEI establishes admission quotas on the basis of scientific/ artistic, cultural, social, economic and other needs.</p>	<p>The doctoral study has the licence to carry out the programme in the scientific area of engineering sciences, the field of graphic technology – processes of graphic reproduction, following contemporary trends in the area of visual communications, new materials and covers a wide spectrum of technologies-from classic printing technologies, computer graphics to multimedia and web technologies. Such a study programme trains highly educated candidates who will upon competition have a wide spectrum of knowledge and knowledge in specific fields of interest and will thus be able to respond to technological, social, economic and market needs in Croatia as well as in the EU. Therefore there is an increasing trend in admission of doctoral candidates in the academic year 2015/2016 (11 candidates) as opposed to previous academic year 2014/2015 (2 candidates) especially in the field of new</p>

	<p>technologies. (Data acquired from the report from the ODS meeting).</p> <table border="1" data-bbox="779 256 2125 667"> <thead> <tr> <th rowspan="2">Ac. year</th> <th colspan="3">PhD students</th> <th rowspan="2">Defended theses</th> <th rowspan="2">Public defence topics</th> </tr> <tr> <th>Full-time students</th> <th>Part-time students</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2010/2011</td> <td>8</td> <td>10</td> <td><b>18</b></td> <td><b>4</b></td> <td>4</td> </tr> <tr> <td>2011/2012</td> <td>0</td> <td>4</td> <td><b>4</b></td> <td><b>5</b></td> <td>6</td> </tr> <tr> <td>2012/2013</td> <td>1</td> <td>7</td> <td><b>8</b></td> <td><b>6</b></td> <td>8</td> </tr> <tr> <td>2013/2014</td> <td>0</td> <td>5</td> <td><b>5</b></td> <td><b>6</b></td> <td>5</td> </tr> <tr> <td>2014/2015</td> <td>0</td> <td>2</td> <td><b>2</b></td> <td><b>5</b></td> <td>6</td> </tr> <tr> <td>2015/2016</td> <td>4</td> <td>7</td> <td><b>11</b></td> <td><b>2</b></td> <td>3</td> </tr> <tr> <td>Total:</td> <td>13</td> <td>35</td> <td><b>48</b></td> <td><b>28</b></td> <td>32</td> </tr> </tbody> </table> <p>Of 48 enrolled PhD students in this period 28 students defended their doctoral thesis, which points to a high graduation rate. To our knowledge there are no unemployed PhD holders in the field of graphic technology.</p>	Ac. year	PhD students			Defended theses	Public defence topics	Full-time students	Part-time students	Total	2010/2011	8	10	<b>18</b>	<b>4</b>	4	2011/2012	0	4	<b>4</b>	<b>5</b>	6	2012/2013	1	7	<b>8</b>	<b>6</b>	8	2013/2014	0	5	<b>5</b>	<b>6</b>	5	2014/2015	0	2	<b>2</b>	<b>5</b>	6	2015/2016	4	7	<b>11</b>	<b>2</b>	3	Total:	13	35	<b>48</b>	<b>28</b>	32
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<p>3.3. The HEI establishes the admission quotas taking into account the funding available to the candidates, i.e., on the basis of the absorption potentials of research projects or other sources of funding.</p>	<p>In the above mentioned period from 1st June 2011 and 31st December 2015 the teaching staff of the Faculty of Graphic Arts participated in 36 scientific projects, financed by the Ministry of Science, Education and Sports, the University of Zagreb and other scientific research support funds.</p> <p>In accordance with the Agreement for long-term institutional funding of scientific research in the years 2013, 2014 and 2015 PhD candidates were granted financial support: 7 PhD candidates for their PhD research, 2 for participation in conferences</p> <p>A certain number of candidates were admitted through collaboration with other institutions or businesses: 17 candidates through businesses and the commercial sector, 19 candidates from public institutions, 5 candidates from local and state administration and 1 candidate from other institutions (Annex 11 – external associates). This shows the non-institutional need for highly educated and expert candidates that have completed the doctoral study at the Faculty of Graphic Arts.</p>																																																			
<p>3.4. The HEI should pay attention to the number of candidates admitted as to provide each with an advisor (a potential supervisor). From the point of admission to the end of doctoral education, efforts are invested so that each candidate has a sustainable research plan and is able to complete doctoral research successfully.</p>	<p>The HEI upon publishing the Call for application defines terms and conditions of admission and reserves the right for the Committee to conduct interviews with prospective candidates. Through the interview the Committee verifies and establishes the interests of prospective candidates for the scientific and research work and if required provides guidelines and advice to prospective candidate. Also upon admission candidates are encouraged to choose their study counsellors from the list of staff at the doctoral study programme who cover their interest areas with their competencies and course plan. In this way the Faculty of Graphic Arts encourages continuous work and individual monitoring of each candidate.</p> <p>After admission each candidate, based on current regulations defined by the Ordinance on doctoral studies at the University of Zagreb, Ordinance 2015 and other regulations is obliged to regularly write and submit annual reports on their research (Form PhD 04). The</p>																																																			

	<p>process of monitoring the work and progress of doctoral candidates is defined at the national level and implemented primarily through the OBAD system.</p>
<p>3.5. The HEI ensures that interested, talented and highly motivated candidates are recruited internationally.</p>	<p>Upon publishing the call for applications the same is published on the Faculty website, widely circulated public media as well as in the official gazette of the Republic of Croatia.</p> <p>The international recognition of the doctoral study is ensured through continuous presentations at international conferences at which the Faculty participates as organizer, co-organizer or participant (international Conference of printing, design and graphic communications Blaž Baromić, MATRIB, Printing and design) as well as through the participation of teachers from international institutions in the courses and committees.</p> <p><i>(<a href="http://www.grf.unizg.hr/plan-i-program-doktorskog-studija-2/">http://www.grf.unizg.hr/plan-i-program-doktorskog-studija-2/</a>)</i></p> <p>Upon admission the Committee decides on admitting candidates based on the terms and conditions of admission. Preference is given to candidates with high grade point average at the graduate level that is to candidates who, in accordance with the requirements of the competition, provide letters of recommendation from relevant experts in the scientific field. Other determining factors are knowledge of English that is proven through submitting specific documentation; a motivation interview with candidates where they prove their interest towards a career in scientific research (presentation of published scientific work if existing).</p>
<p>3.6. The selection process is public and based on choosing the best applicants.</p>	<p>Upon publishing the call for applications to doctoral study the selection process takes place during October. In accordance with Ordinance 2015 and terms and conditions of the call for applications, the Committee establishes whether the applicants meet the stipulated requirements (grade point average at the graduate level, professor recommendations, etc.) and sets up individual motivational interviews with prospective candidates. The interview is used to analyse the current work of the candidate. During the same interview and during the application procedure the candidates define the area of their work in the doctoral study and the Committee pursuant to Article 6 of the Ordinance 2015 appoints the study advisers from the list of teachers who will guide the candidate through the doctoral studies to the official election of supervisor.</p>
<p>3.7. The HEI ensures that the selection procedure is transparent and in line with published criteria, and that there is a transparent complaints procedure.</p>	<p>Upon completion of the selection procedure all relevant documentation is archived in the archives, and the list of admitted applicants is made public. After the selection of candidates under the terms of the competition, rejected applicants have the right to complain in accordance with legal conditions, and in accordance with the instruction of legal recourse or the possibility of filing a complaint against the decision of enrolment in the doctoral studies. This is an integral part of the decision of the Committee. Following the complaint, the applicant has a right to be informed about the strengths and weaknesses of their application and if the complaint is valid the applicant is allowed admission to the study.</p>
<p>3.8. There is a possibility to recognize applicants' and candidates' prior learning.</p>	<p>The recognition of applicants' and candidates' prior learning and achievements relevant for the doctoral programme is defined by amendments to the Ordinance (decision of the Faculty Council of 11 April 2016.)</p>
<p>3.9. Candidates' rights and obligations are defined in relevant HEI regulations and a contract on studying that provides for a high level of supervisory and institutional support to the candidates.</p>	<p>Due to the continuous improvement of the quality of doctoral studies in the observed period at the Faculty of Graphic Arts amendments to the Ordinance on doctoral studies have been passed according to the decisions of the Faculty Council:</p> <p>25 November 2008 Ordinance on Doctoral Studies of Graphic Engineering and Graphic Product Design at the Faculty of Graphic Arts</p> <p>20 April 2010 Ordinance on doctoral studies at the University of Zagreb</p>

	<p>18 October 2010 Ordinance on Doctoral Studies of Graphic Engineering and Graphic Product Design at the Faculty of Graphic Arts</p> <p>13 May 2013 Ordinance on amendments to the Ordinance on Doctoral Studies of Graphic Engineering and Graphic Product Design at the Faculty of Graphic Arts</p> <p>10 February 2014 Ordinance on amendments to the Ordinance on Doctoral Studies of Graphic Engineering and Graphic Product Design at the Faculty of Graphic Arts</p> <p>18 November 2015 Ordinance on doctoral studies of Graphic Engineering and Graphic Product Design at the Faculty of Graphic Arts</p> <p>In addition to the last passed Ordinance 2015, the Faculty of Graphic Arts applies the current Ordinance on doctoral studies at the University of Zagreb. Article 1 and 2 of the Ordinance 2015 define the provisions of the Ordinance on doctoral studies at the University of Zagreb regarding issues not regulated by Ordinance 2015. Doctoral study is organized and managed in accordance with the Ordinance on doctoral studies at the University of Zagreb, which lays down the minimum requirements for the setting up and the implementation of doctoral studies and it regulates special conditions on doctoral studies at the Faculty of Graphic Arts. (Ordinance 2015, Art. 8, 9, 10).</p>
<p>3.10. There are institutional support mechanisms for candidates' successful progression.</p>	<p>After the selection of the doctoral candidate for doctoral studies, during the motivational interview institutional support mechanisms for candidates' successful progression are explained in detail to prospective candidates. All doctoral candidates may use the entire scientific research equipment in the laboratories of the Faculty of Graphic Arts, the library and available databases - Appendix 10. The candidate may use the equipment in agreement with the supervisor, with assistance or independently. Thus, using that equipment, or other equipment outside the Faculty resulted with published research papers as follows:</p> <ul style="list-style-type: none"> <li>- doctoral candidates have published a total of 110 scientific papers,</li> <li>- doctoral candidates have published and presented 205 scientific papers at international conferences,</li> <li>- scientific research of 20 doctoral candidates were funded directly from the funds of the institution through projects at the level of the whole institution (Annex 8)</li> </ul>

4. PROGRAMME AND OUTCOMES

The teaching part of the programme is prescribed by the provisions of the Ordinance on Doctoral Studies of Graphic Engineering and Graphic Product Design at the University of Zagreb, Faculty of Graphic Arts (hereinafter Ordinance 2015), and accounts for about 20% of the programme. The central component of the doctoral study is scientific research (see Art. 8 of the Ordinance). The doctoral candidate is obliged before the defence of the thesis to have published or have accepted for publication at least one (1) article in journal cited in tertiary publications. Article 10 of the Ordinance 2015 stipulates the acquisition of credits in a way that allows the doctoral candidate to individually choose courses they want to take. The acquisition of generic skills is not compulsory and the candidate may acquire them by selecting the courses, which with their learning outcomes allow the acquisition of generic skills. Also, the doctoral candidate is required to orally present at least one paper at an international scientific conference, thematically related to doctoral studies that are to their doctoral research.

Charts - Annex 12 contain information on the activities of doctoral candidates in the form of scientific production in journals (Table 2 Supervisors and doctoral candidates), the acquisition of generic skills of mobility and professional training abroad as well as participation in research projects.

List of workshops and participants

4.1. The content and quality of the doctoral programme are aligned with internationally recognized standards.

<b>Workshops at the Faculty of Graphic Arts</b>	<b>Period</b>	<b>Doctoral candidate</b>	<b>PhD</b>	<b>Faculty members</b>	<b>Others</b>	<b>Total</b>
<i>Learning outcomes in higher education</i>	<i>4 Feb 2014</i>	<i>3</i>	<i>3</i>	<i>17</i>	<i>1</i>	<i>24</i>
<i>Learning outcomes in higher education</i>	<i>13 Feb 2014</i>	<i>2</i>	<i>0</i>	<i>11</i>	<i>2</i>	<i>15</i>
<i>Theoretical basis for the development of e-Courses</i>	<i>11 June 2014</i>	<i>3</i>	<i>2</i>	<i>4</i>	<i>0</i>	<i>9</i>
<i>Teaching facilities in the CMS system</i>	<i>10 July 2014</i>	<i>3</i>	<i>2</i>	<i>7</i>	<i>0</i>	<i>12</i>
<i>Learning outcomes - study program - courses - teaching</i>	<i>15 July 2014</i>	<i>2</i>	<i>2</i>	<i>5</i>	<i>0</i>	<i>9</i>
<i>Multimedia tools in the development of teaching materials</i>	<i>25 Sept 2014</i>	<i>3</i>	<i>0</i>	<i>9</i>	<i>0</i>	<i>12</i>

<b>Workshops outside the Faculty of Graphic Arts</b>	<b>Period</b>	<b>Doctoral candidate</b>	<b>PhD</b>	<b>Faculty members</b>	<b>Others</b>	<b>Total</b>
<i>Active learning and critical thinking in higher education</i>	<i>21 Feb 2014-15 Nov 2014</i>		<i>1</i>	<i>2</i>	<i>1</i>	<i>4</i>
<i>Access to disability in course performance</i>			<i>2</i>			<i>2</i>



	<p>The study program is comparable with the following doctoral programmes:</p> <ul style="list-style-type: none"> <li>- University of Ljubljana Faculty of Natural Sciences and Engineering <a href="http://www.ntf.uni-lj.si/toi/studij/3-stopnja/tekstilstvo-grafika-in-tekstilno-oblikovanje-dr/splosne-informacije/">http://www.ntf.uni-lj.si/toi/studij/3-stopnja/tekstilstvo-grafika-in-tekstilno-oblikovanje-dr/splosne-informacije/</a></li> </ul> <p>Description of the content and other elements of the study programme "Textile, graphics and textile design" is located in the "Proceedings of the doctoral study programme": <a href="http://www.ntf.uni-lj.si/toi/wp-content/uploads/sites/7/2016/02/Zbornik_DR_studija_SLO_V2.pdf">http://www.ntf.uni-lj.si/toi/wp-content/uploads/sites/7/2016/02/Zbornik_DR_studija_SLO_V2.pdf</a></p> <ul style="list-style-type: none"> <li>- University of Novi Sad Faculty of Technical Sciences, doctoral programme "Graphic Engineering and Design" <a href="http://www.ftn.uns.ac.rs/n844762884/graficko-inzenjerstvo-i-dizajn">http://www.ftn.uns.ac.rs/n844762884/graficko-inzenjerstvo-i-dizajn</a></li> </ul> <p>As an example of the draft of interdisciplinary research we enclose the document: <i>Roadmap for Transparency: Important issues to be settled and evaluated regularly by PhD candidate and Supervisor. Name Ph.D. candidate: J. Dolic, Name supervisor: Jesenka Pibernik, Željka Car.</i></p> <p>List of teachers / co-supervisors from other scientific fields and disciplines:</p> <ul style="list-style-type: none"> <li>- Assist. PhD. Marta Klašnjek Gunde, Institute of Chemistry, Ljubljana</li> <li>- PhD. Andrew Gajović, Ruđer Bošković Institute</li> <li>- Prof. PhD. Mario-Osvin Pavčević, Faculty of Electrical Engineering and Computer Science</li> <li>- Assist. PhD. Zeljka Car, University of Zagreb, Faculty of Electrical Engineering and Computer Science</li> <li>- Prof. PhD. Zlata Hrnjak-Murčić, University of Zagreb, Faculty of Chemical Engineering and Technology</li> <li>- Assist. PhD. Zvonimir Sabati, University of Zagreb Faculty of Organization and Informatics</li> <li>- PhD. Dubravko Risović, Scientific Research Institute "Ruđer Bošković"</li> </ul>
<p>4.2. Programme learning outcomes, as well as the learning outcomes within it, are aligned with the level 8.2 of the CroQF. They clearly describe the competencies the candidates will develop during the doctoral programme, including the ethical requirements of doing research.</p>	<p>Course objectives, intended outcomes, content, teaching and learning methods for each individual course are described in the document: Information package of doctoral studies.</p> <p>The mastering of ethical practice in scientific research / artistic work is carried out under the guidance of a supervisor and in accordance to the provisions of the Code of Ethics of the University of Zagreb, paragraph III of Art. 14-17 containing moral principles and principles of professional ethical conduct in professional and public activities of teachers, scientists, artists and other employees of the University of Zagreb. Based on the decision of the Faculty Council, the Ethics Committee of the Faculty has been established, which addresses reports relating to violations of the Code of Ethics of the University of Zagreb, as well as the Disciplinary Commission that works in a manner prescribed by the Ordinance on disciplinary accountability of students. <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/SMP_odluke_i_pravilnici_pravilnik-o-stegovnoj-odgovornosti-studenata.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/SMP_odluke_i_pravilnici_pravilnik-o-stegovnoj-odgovornosti-studenata.pdf</a></p> <p>Doctoral candidates Tamara Tomašegović and Ivana Plazonić showed exceptional skills of project planning through their high placement of their project proposals in the "Research Fellowships for professional development of young researchers and doctoral</p>

	candidates" which was announced by the Ministry of science, education and sport in 2015.
4.3. Programme learning outcomes are logically and clearly connected with teaching contents, as well as the contents included in supervision and research.	
4.4. The doctoral programme ensures the achievement of learning outcomes and competencies aligned with the level 8.2 of the CroQF.	<ul style="list-style-type: none"> <li>- a sample of dissertation <ul style="list-style-type: none"> <li>- dr.sc. Gorazd Golob</li> <li>- dr.sc. Valdec Dean</li> <li>- dr.sc. Cigula Tomislav</li> <li>- dr.sc. Dolić Jurica</li> <li>- dr.sc. Morić Kolarić Branka</li> <li>- dr.sc. Bates Irena</li> <li>- dr.sc. Budimir Ivan</li> <li>- dr.sc. Tamara Tomašegović</li> </ul> </li>   <li>- a sample of published scientific papers of doctoral candidates (especially high-impact publications coming out of doctoral research); <p><i>Skenderović Božičević M., Gajović A., Zjakić I.; "Identifying a common origin of toner printed counterfeit banknotes by micro-Raman spectroscopy" Forensic Science International 223 (2012) 314–320.</i></p> <p><i>Dolić, J.; Pibernik, J.; Majnarić, I. Influence of UV Varnish Pattern Effect on Print Quality. Journal of Imaging Science and Technology. 58 (2014), 6; 60501-1-60501-9</i></p> </li>   <li>- a sample of seminar papers, conference presentations etc. <p><i>Vukoje, M. Bates, I.; Plazonić, I. Optical stability of papers with wheat fibers after accelerated ageing. International Conference MATRIB 2015 Materials, Wear, Recycling Proceedings. Čorić, Danko ; Žmak, Irena (ed.). Zagreb : Hrvatsko društvo za materijale i tribologiju, 2015. 362-369 (lecture, international peer-review, published paper, scientific).</i></p> <p><i>Jakovljević, M.; Friškovec, M.; Klanjšek Gunde, M.; Lozo, B. Optical properties of thermochromic liquid crystal printing inks. Proceedings of the 5-th International Scientific Conference „Printing Future Days 2013“. Berlin : VWB – Verlag für Wissenschaft und Bildung, 2013. 169-173 (lecture, international peer-review, published paper, scientific).</i></p> </li> </ul>

	<p><i>Bates, I.; Plazonić, I.; Koren, T. The reproduction quality of the lines on paper substrates with straw fibers. Proceedings of joint conference Wood Pulp &amp; Paper Polygrafia academica 2014. Dvonka, Vladimir et. al. (ed.). Bratislava : Slovenska tehnicka fakulteta v Bratislave, 2014. 276-281 (lecture, international peer-review, published paper, scientific).</i></p>
<p>4.5. Teaching methods (and ECTS, if applicable) are appropriate for level 8.2 of the CroQF and assure achievement of clearly defined learning outcomes.</p>	<p>Teaching is done through consultative courses  <a href="http://www.grf.unizg.hr/wp-content/uploads/2010/09/konzultativna-nastava.pdf">http://www.grf.unizg.hr/wp-content/uploads/2010/09/konzultativna-nastava.pdf</a>, which is more appropriate for developing individual research skills. The intended learning outcomes of such teaching methods are visible in the number of scientific papers that the candidates published in collaboration with their teachers.</p> <p><i>Katarina Itrić</i></p> <ol style="list-style-type: none"> <li>1. <i>Itrić, Katarina; Džimbeg-Malčić, Vesna; Modrić, Damir: Optical deterioration of coated wrapping paper. // Acta graphica. 26 (2015) , 1-2; 5-10 (scientific article).</i></li> <li>2. <i>Bates, Irena; Džimbeg-Malčić, Vesna; Itrić, Katarina: Optical deterioration of samples printed with basic Pantone inks. // Acta graphica, Journal for Printing Science and Graphic Communications. 23 (2012) , 3-4; 79-90 (scientific article).</i></li> <li>3. <i>Džimbeg-Malčić, Vesna; Barbarić-Mikočević, Željka; Itrić, Katarina: Kubelka-Munk Theory in Describing Optical Properties of Paper (II). // Tehnicki Vjesnik-Technical Gazette. 19 (2012) , 1; 191-196 (scientific review article).</i></li> <li>4. <i>Džimbeg-Malčić, Vesna; Barbarić-Mikočević, Željka; Itrić, Katarina: Kubelka-Munk Theory in Describing Optical Properties of Paper (I). // Tehnički -Technical Gazette. 18 (2011) , 1; 117-124 (scientific review article).</i></li> </ol> <p><i>Darijo Čerepinko</i>  <i>Čerepinko, Darijo; Džimbeg-Malčić, Vesna: Pregled tehnologija elektroničkog papira i pretpostavke budućeg razvoja e-papira. // Tehnički glasnik. 7 (2013) , 1; 91-96 (scientific review article).</i></p> <p><i>Ivana Plazonić - papers published in the period from January 2011 to 29 April 2014 (date of thesis defence)</i></p> <p><i>Original scientific and review articles in CC journals</i>  <i>Barbarić-Mikočević, Željka; Plazonić, Ivana; Džimbeg-Malčić, Vesna: The deinkability improvement of offset prints made from a two-side coated substrate. // BioResources. 8 (2013) ; 557-570 (scientific article).</i></p> <p><i>Scientific papers in other journals</i>  <i>Plazonić, Ivana; Džimbeg-Malčić, Vesna; Barbarić-Mikočević, Željka: A Novel Eco-Alkali Chemistry in Newspaper Flotation Deinking. // Acta graphica. 23 (2012) ; 91-98 (scientific article).</i></p> <p><i>Scientific conference papers with international peer-review</i>  <i>Plazonić, Ivana; Barbarić-Mikočević, Željka; Džimbeg-Malčić, Vesna: Chemical composition of triticale straw as a paper fiber</i></p>

	<p>source // <i>Proceedings of joint conference Wood Pulp &amp; Paper Polygrafia academica 2014. / Dvonka, Vladimir et. al. (ed.). Bratislava : Slovenska tehnicka fakulteta v Bratislave, 2014. 292-297 (lecture, international peer-review, published paper, scientific).</i></p> <p><i>Abstracts in refereed conference paper</i>  <i>Plazonić, Ivana; Barbarić-Mikočević, Željka; Džimbeg-Malčić, Vesna; Ignjatić Zokić, Tatjana; Milčić Diana. The New Environmental Friendly Newspaper Deinking Approach // ANQUE ICCE 2012 / Carlos Negro Alvarez (ed.). ANQUE, 2012. SPP-70-SPP-71 (poster, international peer-review, abstract, scientific).</i></p> <p><i>Dorela Dujmušić</i>  <i>Dujmusic, D.; Dzimbeg Malcic, V.; Barbaric Mikocevic, Z.; Plazonic, I.; Bates, I: THE REFLECTANCE SPECTRUM OF PAPERS EXPOSED TO ACCELERATED AGEING ACCORDING TO USED FLOTATION DEINKING METHOD, Zbornik sažetaka, 19. međunarodna konferencija tiskarstva, dizajna i grafičkih komunikacija Blaž Baromić, 17, Senj, 16. - 19. rujan 2015. godine, Hrvatska / Proceedings of abstracts, 19th International conference of printing, design and graphic communications Blaž Baromić, Senj, 16 - 19 September 2015, Croatia (scientific paper)</i></p> <p><i>Seminar papers</i></p> <p><i>Ivana Ljevak: Teorija imaging reflektometra</i>  <i>Eduard Galić: Indeks loma i reflektometrija u suprotnosti s elipsometrijom</i>  <i>Martina Skenderović-Božičević: Fizikalni principi ramanske spektroskopije i energetske disperzivne fluorescencije rendgenskih zraka</i></p>
<p>4.6. The programme enables acquisition of general (transferable) skills.</p>	<p>An example of an international workshop for doctoral candidates and young researches is COST Training School „New Technologies for treatments in the end-of-use of packaging materials“ within the COST FP 1003 Project „Impact of renewable materials in packaging for sustainability – Development of renewable fibre and bio-based materials for new packaging applications“, organized at the Faculty of Graphic Arts in 2011. Active participants of the workshop and lectures: Bates I., Jakovljević M., Kovačević D., Šarčević I., Bota J.</p> <p>Although participation in such forms of education is not valued with ECTS credits, listed are examples of participating doctoral candidates in workshops:</p> <ul style="list-style-type: none"> <li>- <i>Čigula T., Tomašegović T. : Istraživačke stipendije za profesionalni razvoj mladih istraživača i poslijedoktoranada / Research Fellowships for professional development of young researchers and doctoral candidates, 11 September 2014.</i></li> <li>- <i>Cviljušac V. : “Kako prezentirati znanost u medijima”/ “How to present science in the media” as part of the Modernizations of doctoral education through the implementation of the Croatian Qualification Framework (MODOC), 12 January 2015.</i></li> <li>- <i>Žganjar I. : Suradnja s industrijom / Cooperation with industry, Zvonimirova 8, Sveučilište u Zagrebu, Ožujak mjesec inovacija i istraživanja / March - the month of innovation and research, 23 March 2011.; Mogućnosti financiranja kroz pretpristupne i strukturne fondove / The possibility of financing through the pre-accession and structural funds, Kongresni centar, HYPO EXPO,</i></li> </ul>

	<p><i>Slavonska avenija 6., 10000 Zagreb, 22 September 2011.</i></p> <ul style="list-style-type: none"> <li>- <i>Zlatar S. : Pilot radionice za doktorande Projekt MODOC, Leadership- Vještine predvodništva- Kako kvalitetno prezentirati znanost u medijima / Pilot workshop for doctoral candidates Project MODOC, Leadership Skills - How to present science in the media, 10 – 20 December 2014.</i></li> <li>- <i>Bates I. : Stručno usavršavanje – Aktivno učenje i kritičko mišljenje u visokoškolskoj nastavi / Professional training - Active learning and critical thinking in higher education, 2014. Forum za Slobodu odgoja.</i></li> </ul>
<p>4.7. Teaching content is adapted to the needs of current and future research and candidates' training (individual course plans, generic skills etc.).</p>	<p>Candidates write individual annual research plans together with their supervisors and are obliged to submit the plan through Form PhD 04. The supervisor evaluates the candidate and submits the annual report on fulfilment of candidates plan and his development during the course of study through Form PhD 05.</p>
<p>4.8. The programme ensures quality through international connections and teacher and candidate mobility.</p>	<ul style="list-style-type: none"> <li>- internationalisation of the doctoral programme is achieved by providing opportunities for and using research staff mobility;</li> </ul> <p>Research staff mobility is provided through ERASMUS, CEPUS and BASILEUS cooperation agreements with European scientific institutions. List of international treaties is located on the website: <a href="http://www.grf.unizg.hr/erasmus-2012-2013/">http://www.grf.unizg.hr/erasmus-2012-2013/</a></p> <p>List of international mobility of scientific staff can be found on the website of the University of Zagreb under "Record of international cooperation" <a href="http://medjunarodna.unizg.hr/">http://medjunarodna.unizg.hr/</a></p> <ul style="list-style-type: none"> <li>- it systematically provides information on opportunities for candidate mobility, encourages and achieves it;</li> </ul> <p>The Office for International Cooperation of the University of Zagreb Faculty of Graphic Arts continuously provides information and encourages doctoral candidates mobility. Thus, doctoral candidate Maja Matas achieved mobility for the purpose of research work at the University of Ljubljana.</p> <ul style="list-style-type: none"> <li>- ensures means to attract and attracts international faculty and excellent candidates to the programme (or a part of it);</li> </ul> <p>The internationalization of the programme is ensured with courses carried out by foreign lecturers (three professors from the University of Ljubljana, Faculty of Natural Sciences). So far, the programme has successfully been completed by 1 (one) foreign citizen - Gorazd Golob.</p> <ul style="list-style-type: none"> <li>- the HEI is aware of the European Charter of Researchers and Code of Conduct and implements its principles.</li> </ul> <p>The University in Zagreb has signed the Declaration on Accession to the European Charter for Researchers and the Code for the Recruitment of Researchers and accordingly prepared the Strategy of Human Resources and Action Plan. Both documents are</p>

published on the Faculty website

[http://www.grf.unizg.hr/wp-content/uploads/2010/09/SBG\\_2013\\_Dokumenti\\_Interna\\_analiza.pdf](http://www.grf.unizg.hr/wp-content/uploads/2010/09/SBG_2013_Dokumenti_Interna_analiza.pdf)

<http://www.unizg.hr/istrazivanje/istrazivanje-i-inovacije/hr-excellence-in-research/>

The Faculty of Graphic Arts encourages candidate mobility and encourages candidates to study abroad.

- Evidence on opportunities for candidates for professional training abroad :

- *Željko Knok, ERASMUS exchange Turkey, Pamukale*
- *Tamara Tomšegović, Budapest, Faculty of Light Industry and Environmental Engineering, 2012.; Novi Sad, Faculty of Technical Sciences, 2013.; Pardubice, Faculty of Chemical Technology, University of Pardubice, 2014.; Madrid, Universidad Complutense de Madrid, 2014.; Swansea, Welsh Centre for Printing and Coating, 2015.; Norrköping, Linköping University, 2015.*
- *Tamara Tomšegović, Budapest, Faculty of Light Industry and Environmental Engineering, 2012.; Novi Sad, Faculty of Technical Sciences, 2013.; Pardubice, Faculty of Chemical Technology, University of Pardubice, 2014.; Madrid, Universidad Complutense de Madrid, 2014.; Swansea, Welsh Centre for Printing and Coating, 2015.; Norrköping, Linköping University, 2015.*
- *Dorotea Kovačević, National Academy of Arts, Sofia, Bulgaria, 2015.; University of Ljubljana Faculty of Natural Sciences and Engineering, Slovenia.; 2014; University of Ljubljana Faculty of Natural Sciences and Engineering, Slovenia, 2013.*
- *Maja Jakovljević, Scientific training related to preliminary research for the purpose of a doctoral thesis, the funds allocated through the contest of the Republic of Slovenia, 2013.; Scientific training at the National Institute of Chemistry in Ljubljana, Slovenia, funds allocated through the competition grants for doctoral candidates and assistants, 2015.; STSM (Short Term Scientific Mission) within the COST Action FP1104 Project; scientific research for the purpose of a doctoral thesis at the National Institute of Chemistry in Ljubljana, 2016.*
- *Aleksandra Bernašek Petrinec, Erasmus internships, University of Ljubljana Faculty of Natural Sciences and Engineering, 2011., Erasmus scientific training Leiria, Portugal, Polytechnic Institute of Leiria, 2012.; Erasmus scientific training University of Ljubljana Faculty of Natural Sciences and Engineering, 2015.*
- *Marina Vukoje Scientific training (as part of a bilateral project IMPRO-FOOD-PACK), Dresden, Germany; Technische Universität Dresden; Institut für Holztechnik und Papiertechnik, 2013.; Scientific training (COST FP1003 BioMatPack Winter Training School – Use of nanopolysaccharides in packaging), Grenoble, France, Grenoble INP-Pagora, 2013.; Scientific training (COST FP1003 BioMatPack Autumn Training School – Innovation Management), Valencia, Spain; ITENE Instituto Tecnológico del Embalaje, Transporte y Logística 2014.; Scientific training – Erasmus Tomar, Portugal; Instituto Politécnico de Tomar, 2015.*
- *Josip Bota Erasmus training National Academy of Art - Sofia, Bulgaria, 2015.; Estonian Academy of Arts / Eesti Kunstiakadeemia, Tallin Estonia, 2013.; Artevelde University College Gent, Belgium, 2011.*
- *Iva Šarčević Erasmus professional training University of Ljubljana Faculty of Natural Sciences and Engineering, 2015., Hochschule der Medien, Stuttgart 2012.*

- Ante Poljičak Erasmus professional training Madrid, Universidad Complutense de Madrid, 2014.; University of Ljubljana Faculty of Natural Sciences and Engineering, 2015.
- Irena Bates Erasmus professional training Bratislava, Slovakia, Faculty of Chemical and Food Technology, Slovak University of Technology, 2014.; Athens, Greece, Technological Educational Institution (TEI) of Athens, 2015.
- Jurica Dolić Erasmus professional training Hochschule der Medien, Stuttgart 2012; Artevelde University College Gent, Belgium, 2012.
- Tomislav Cigula CEEPUS Novi Sad, University of Novi Sad, Faculty of Engineering, 2014.; Sofia, University of Chemical Technology and Metallurgy, Bulgaria, Department of Printing Arts, Pulp and Paper, 2014.; ERASMUS Budapest, Obuda university, Faculty of Light Industry and Environmental Engineering, 2013.; Professional training Chemnitz, Printpromotion GmbH, Ausbildungszentrum Polygrafie, 2012.; Scientific training Maribor, University of Maribor, Faculty of Chemistry and Chemical Technology, 2012.
- Ivana Plazonić professional training Erasmus Tomar, Portugal, 2015.
- Maja Rudolf Erasmus professional training University of Ljubljana Faculty of Natural Sciences and Engineering, 2012.
- Diana Bratić Erasmus professional training Hochschule der Medien, Stuttgart 2012; Artevelde University College Gent, Belgium, 2015.
- Gorazd Golob Ceepus CIII-RS-0704-03-1415 Novi Sad, University of Novi Sad, Faculty of Technical Sciences, Department of Graphic Engineering and Design, 2014.; Ceepus CIII-RS-0704-02-1314-M-72800 Swansea, Welsh Centre for Printing and Coating (WCPC), College of Engineering, Swansea University, 2014., Ceepus CPMNr: CIII-RS-0704-01-1213-M-66442 Chemnitz, Chemnitz University of Technology, Pardubice, University of Pardubice, Department of Graphic Arts and Photophysics, 2013.; Ceepus CIII-RS-0704-01-1213 Sofia, University of Chemical Technology and Metallurgy, Department of Printing Arts, Pulp and Paper, 2012.; ERASMUS (STA) Erasmus Teaching Staff Mobility Engineering and Design, Swansea, Welsh Centre for Printing and Coating, 2014.; VŽU/ERASMUS Individual mobility Pardubice, University of Pardubice, Faculty of Chemical Technology, 2013.

Evidence on encouraging candidates to participate in international conferences is ensured through Article 10 of the Ordinance 2015 which stipulates the candidate be awarded 15 ECTS points for scientific paper orally presented at an international conference. The Faculty covers admission fees to several international conferences relevant to the area of graphic technology and design.

- opportunities to write the thesis in a foreign language;

*The thesis' of candidates Gorazda Goloba and Tamara Tomašegović are both written and defended in English.*

- list of research collaborations with foreign HEIs and their benefits for the candidates.

Doctoral candidates are actively involved in international research projects:

- Tamara Tomašegović, Quality insurance of processes printing plates, Bilateral Project Croatia - Germany,
- Maja Jakovljević, Treatments of Fiber-based Materials for Improved Food Packaging; Impact of renewable materials in packaging for

*sustainability – development of renewable fibre and bio-based materials for new packaging applications (COST FP 1003); New possibilities for print media and packaging – combining print with digital (COST FP1104).*

- *Marina Vukoje COST Action FP 1003 "Impact of Renewable Materials in Packaging for Sustainability – Development of Renewable Fibre and Bio-Based Materials for New Packaging Applications", moderator: Kennert Johansson. Participation at meetings of the working group WG3 "End-of-Life"(Sheffield, England, March 2014; Munich, Germany, May 2014..) and participation on two workshops (Training School); COST Action FP 1405 "Active and intelligent fibre-based packaging – innovation and market introduction", moderator: Sanne Tiekstra. Participation at meetings of the working group (Aveiro, Portugal, September 2015).*
- *Ante Poljičak „New possibilities for print media and packaging – combining print with digital“ Cost action FP1104.*
- *Jurica Dolić IPA project: ICT Competence Network for Innovative Services for Persons with Complex Communication Needs*
- *Tomislav Cigula Elektrokemijska ispitivanja i korozivna otpornost aluminija i njegovih oksida i primjena na tiskovnoj formi za plošni tisak, Bilateral project Croatia - Slovenia; New graphic applications with chromogenic printing inks, Bilateral project Croatia - Slovenia; Quality insurance of processes printing plates, Bilateral Project Croatia - Germany.*

*List of information on workshops for doctoral candidates and supervisors:*

1. Workshop for doctoral candidates: Networking for Doctoral Researchers, 3 to 4 December 2012.
2. Workshop: "Modern web applications for search of scientific papers and making personal database of literature references," 6/18/2014.
3. Workshop for doctoral candidates - The commercialization of research results, 4 October 2012
4. Workshop on cooperation with the industry Contracting and implementation of co-operation, 10 October 2012
5. Workshop for doctoral candidates Communication for Doctoral Researchers, 6 to 7 November 2012.
6. The pilot workshop organized through Project MODO 2014: Self Management, 15 and 16 December, Career Building 19 - 20 December, Leadership 10 and 11 December, Professional effectiveness 18 and 19 December
7. Workshop for doctoral candidates on time management and project management, 15 and 25 June 2012.
8. Workshop Commercialization of research results within the project Development of skills transfer during doctoral education, 4 October 2012
9. Workshop for doctoral candidates Communication for Doctoral Researchers 6 to 7 November 2012.
10. Workshop for supervisors and recommendations on the application of the Ordinance on doctoral studies at the University of Zagreb, 27 - 28. January 2011
11. Workshop Creating Project Proposals, 2011



## III. Tables

**Table 1 Teaching Staff**

Teacher Institution Link to CROSBİ database**	Scientific (or scientific-teaching) title and area/field of election	A	A1	B	C	D	Course (and course type) within the programme and total workload	Workload in norm-hours***2014/15
Banić Dubravko University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=210885">http://bib.irb.hr/lista-radova?autor=210885</a>	Senior research associate (associate professor); area: technical sciences / field: graphic technology	5/2	1	-/-	-/-	1/1	Parameter optimization of construction of printing machines (Consultation)	0
							Visualisation in graphic products modelling (Consultation)	0
							Workload in 1st and 2nd cycle	338
							Total workload	338
Barbarić-Mikočević Željka University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=172095">http://bib.irb.hr/lista-radova?autor=172095</a>	Research adviser; (associate professor); area: technical sciences / field: graphic technology	5/3	5	12/12	1/1	2/2	Chemical analysis of graphical technology materials (Consultation)	10
							Workload in 1st and 2nd cycle	187,5
							Total workload	197,5
Bates Irena University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=290153">http://bib.irb.hr/lista-radova?autor=290153</a>	Research associate; (assistant professor); area: technical sciences / field: graphic technology	9/3	7	5/8	2/2	2/2	Advanced printing systems (Consultation)	0
							Workload in 1st and 2nd cycle	222
							Total workload	222
Bjelovučić Kopilović Sanja University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=174132">http://bib.irb.hr/lista-radova?autor=174132</a>	Senior research associate (associate professor); area: technical sciences / field: graphic technology		1	-/0	-/0	0/1	Virtual people (Consultation)	0
							Workload in 1st and 2nd cycle	390
							Total workload	390

Bolanča Mirković Ivana University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=255110">http://bib.irb.hr/lista-radova?autor=255110</a>	Senior research associate (associate professor); area: technical sciences / field: graphic technology	6/2	4	3/5	1/2	1/2	Nanotechnology and the environment (Consultation)	0
							New technologies and the environment (Consultation)	0
							Workload in 1st and 2nd cycle	202,5
							Total workload	202,5
Brozović Maja University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=211142">http://bib.irb.hr/lista-radova?autor=211142</a>	Research adviser; full professor); area: technical sciences / field: graphic technology	3/2	1	1/1	1/1	1/1	Graphic structures (Consultation)	0
							Methodology of presentation of graphics solutions (Consultation)	0
							Workload in 1st and 2nd cycle	312
							Total workload	312
Džimbeg-Malčić Vesna University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=68182">http://bib.irb.hr/lista-radova?autor=68182</a>	Research adviser; (associate professor); area: technical sciences / field: graphic technology	8/3	6	12/12	1/1	2/1	Physical principles of non-destructive measurement methods in graphic reproduction (Consultation)	30
							Interaction of electromagnetic radiation with printing surfaces (Consultation)	30
							Workload in 1st and 2nd cycle	207
							Total workload	267
Hladnik Aleš University of Ljubljana, Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design, <a href="http://sicris.izum.si/search/rsr.aspx?lang=eng&amp;id=9082">http://sicris.izum.si/search/rsr.aspx?lang=eng&amp;id=9082</a>	Senior research associate; (associate professor); area: technical sciences / field: graphic and informatics technology	17/5	25	25/40	3/3	6/7	Modern statistical methods in natural sciences and technics (Consultation)	20
							Workload in 1st and 2nd cycle	
							Total workload	20
Ivanković Marica University of Zagreb Faculty of Chemical Engineering and Technology <a href="http://bib.irb.hr/lista-radova?autor=127321">http://bib.irb.hr/lista-radova?autor=127321</a>	Research adviser (full professor with tenure) Technical area / fields: chemical engineering and basic technical sciences	7/1	7	39/39	4/3	10/12	Physical and chemical properties of polymer materials (Consultation)	0
							Workload in 1st and 2nd cycle	372
							Total workload	372
Jamnicki Sonja University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=265743">http://bib.irb.hr/lista-radova?autor=265743</a>	Research associate (assistant professor); area: technical sciences / field: graphic technology	9/8	3	0/0	0/0	1/1	Packaging materials (Consultation)	0
							Workload in 1st and 2nd cycle	240
							Total workload	240
Jelenčić Jasenka			7	8/8	2/2	7/7	Polymerisation processes (Consultation)	0
							Workload in 1st and 2nd cycle	
							Total workload	0

Knešaurek Nina University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=105133">http://bib.irb.hr/lista-radova?autor=105133</a>	Senior research associate (associate professor); area: technical sciences / field: graphic technology	2/1	2	7/10	1/1	1/2	Colorimetric methods in graphic reproduction (Consultation)	0
							Workload in 1st and 2nd cycle	297
							Total workload	297
Koren Antun University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=141912">http://bib.irb.hr/lista-radova?autor=141912</a>	Research adviser (full professor); area: technical sciences / field: graphic technology	3/0	0	0/0	0/0	1/0	Information security in print (Consultation)	0
							Workload in 1st and 2nd cycle	338
							Total workload	338
Lajić Branka University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=172130">http://bib.irb.hr/lista-radova?autor=172130</a>	Research associate; (assistant professor); area: technical sciences / field: graphic technology		3	2/2	1/1	2/2	Packaging tasks (Consultation)	0
							Workload in 1st and 2nd cycle	660
							Total workload	660
Lozo Branka University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=172126">http://bib.irb.hr/lista-radova?autor=172126</a>	Research adviser (full professor); area: technical sciences / field: graphic technology	11/6	7	2/5	1/1	3/4	Non-destructive measurement methods in graphic technology (Consultation)	0
							Workload in 1st and 2nd cycle	285
							Workload at other HEIs	90
							Total workload	375
Mahović Poljaček Sanja University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=273165">http://bib.irb.hr/lista-radova?autor=273165</a>	Research adviser (associate professor) area: technical sciences / field: graphic technology	11/7	6	4/7	2/2	4/4	Electrochemical methods in graphic technology (Consultation)	0
							Advanced recording processes on printing forms (Consultation)	0
							Workload in 1st and 2nd cycle	345
							Total workload	345
Majnarić Igor University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=245651">http://bib.irb.hr/lista-radova?autor=245651</a>	Senior research associate (assistant professor); area: technical sciences / field: graphic technology	11/3	10	5/7	2/2	2/2	Screening elements in print (Consultation)	20
							Workload in 1st and 2nd cycle	300
							Workload at other HEIs	90
							Total workload	410
Mandić Lidija University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=211640">http://bib.irb.hr/lista-radova?autor=211640</a>	Research adviser (associate professor); area: technical sciences / field: graphic technology	14/10	5	13/27	2/1	2/1	Models for displaying images in different media (Consultation)	15
							Workload in 1st and 2nd cycle	300
							Total workload	315

Matijević Mile University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=308535">http://bib.irb.hr/lista-radova?autor=308535</a>	Research associate (assistant professor); area: technical sciences / field: graphic technology	5/1	5	2/2	1/1	1/1	Qualitative methodology in graphic science (Consultation)	0
							Workload in 1st and 2nd cycle	184
							Total workload	184
Mikota Miroslav University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=197062">http://bib.irb.hr/lista-radova?autor=197062</a>	Research associate (assistant professor); area: technical sciences / field: graphic technology	8/2	2	0/0	0/0	0/0	Graphic design of media campaigns (Consultation)	0
							Workload in 1st and 2nd cycle	710
							Total workload	710
Milčić Diana University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=213596">http://bib.irb.hr/lista-radova?autor=213596</a>	Research adviser (full professor); area: technical sciences / field: graphic technology	6/7	3	0/0	0/0	0/1	User interface design (Consultation)	0
							Design theory (Consultation)	0
							Workload in 1st and 2nd cycle	195
							Total workload	195
Milković Marin University North, Koprivnica <a href="https://bib.irb.hr/lista-radova?autor=306814">https://bib.irb.hr/lista-radova?autor=306814</a>	Research adviser (full professor); area: technical sciences / field: graphic technology	10/3	21	13/13	2/2	2/2	Methodology of scientific research (Consultation)	0
							Workload in 1st and 2nd cycle	
							Total workload	0
Modrić Damir University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=147255">http://bib.irb.hr/lista-radova?autor=147255</a>	Research adviser (assistant professor); area: technical sciences / field: graphic technology	6/2	5	4/5	1/1	2/2	Physical principles of non-destructive measurement methods in graphic reproduction (Consultation)	0
							Operation research (Consultation)	0
							Workload in 1st and 2nd cycle	375
							Total workload	375
Možina Klementina University of Ljubljana, Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design <a href="http://izumbib.izum.si/bibliografije/Y20160413080100-A4960867.html">http://izumbib.izum.si/bibliografije/Y20160413080100-A4960867.html</a> <a href="http://izumbib.izum.si/bibliografije/A20160413075844-20447.html">http://izumbib.izum.si/bibliografije/A20160413075844-20447.html</a>	Senior research associate; (associate professor); area: technical sciences / field: graphic and informatics technology Information and graphic technology	13/8	12	6/5	2/2	2/2	Typography theory (Consultation)	0
							Workload in 1st and 2nd cycle	300
							Total workload	300

Mrvac Nikola University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=211232">http://bib.irb.hr/lista-radova?autor=211232</a>	Research adviser (full professor); interdisciplinary scientific area / fields: graphic technology, information and communication	10/4	10	7/7	1/1	2/3	Communication science of graphic communications (Consultation)	30
							Information presentation (Consultation)	30
							Workload in 1st and 2nd cycle	327
							Total workload	387
Muck Tadeja University of Ljubljana, Faculty of Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design <a href="http://sicris.izum.si/search/rsr.aspx?lang=slv&amp;id=11614">http://sicris.izum.si/search/rsr.aspx?lang=slv&amp;id=11614</a>	Research adviser (full professor); area: technical sciences / field: graphic and informatics technology	25/3	23	18/21	3/2	5/5	Research methods of printing material interaction (Consultation)	0
							Workload in 1st and 2nd cycle	
							Total workload	0
Mudronja Vedran		10/1	3	3/2	1/1	2/2	Quality management (Consultation)	0
							Workload in 1st and 2nd cycle	
							Total workload	0
Osterman Parac Đurđica University of Zagreb Faculty of Textile Technology <a href="https://bib.irb.hr/lista-radova?autor=75360">https://bib.irb.hr/lista-radova?autor=75360</a>	Research adviser (full professor); area: technical sciences / field: textile technology	14/2	8	3/9	½	3/5	Physical and chemical properties of dyeing agents (Consultation)	20
							Workload in 1st and 2nd cycle	
							Total workload	20
Pap Klaudio University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=162136">http://bib.irb.hr/lista-radova?autor=162136</a>	Research adviser (full professor); area: technical sciences / field: graphic technology		3	5/12	2/2	2/4	Graphic web technologies (Consultation)	0
							Multimedia communications (Consultation)	0
							Workload in 1st and 2nd cycle	315
							Total workload	315
Pasanec Preprotić Suzana University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=303526">http://bib.irb.hr/lista-radova?autor=303526</a>	Research associate (assistant professor); area: technical sciences / field: graphic technology	10/4	5	0/0	0/0	0/0	Bookbinding through time (Consultation)	0
							Workload in 1st and 2nd cycle	570
							Total workload	570
Pibernik Jesenka University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=226815">http://bib.irb.hr/lista-radova?autor=226815</a>	Research adviser (associate professor); area: technical sciences / field: graphic technology	7/7	6	0/0	0/0	0/0	Digital space design (Consultation)	0
							Packaging tasks (Consultation)	0
							Workload in 1st and 2nd cycle	300
							Total workload	300

Rožić Mirela University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=210874">http://bib.irb.hr/lista-radova?autor=210874</a>	Research adviser (full professor); area: technical sciences / field: graphic technology	5/2	5	15/14	2/2	8/9	Chemical analysis of graphical technology materials (Consultation)	10
							Workload in 1st and 2nd cycle	315
							Total workload	325
Skala Karolj Ruđer Bošković Institute, Zagreb <a href="http://bib.irb.hr/lista-radova?autor=64216">http://bib.irb.hr/lista-radova?autor=64216</a>	Research adviser (full professor); area: technical sciences	13/11	10	9/9	½	4/5	Multimedia network technologies (Consultation)	0
							Multimedia systems (Consultation)	0
							Workload in 1st and 2nd cycle	
							Total workload	0
Skala Tibor University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=265721">http://bib.irb.hr/lista-radova?autor=265721</a>	Research associate (assistant professor); area: technical sciences / field: graphic technology	7/4	5	9/10	2/2	2/3	Multimedia broadband networks (Consultation)	0
							Workload in 1st and 2nd cycle	315
							Total workload	315
Strgar Kurečić Maja University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=218041">http://bib.irb.hr/lista-radova?autor=218041</a>	Senior research associate (assistant professor); area: technical sciences / field: graphic technology	10/3	4	0/2	0/1	0/1	Colour management in digital printing (Consultation)	0
							Workload in 1st and 2nd cycle	285
							Total workload	285
Tomiša Mario University North, Koprivnica <a href="https://bib.irb.hr/lista-radova?autor=299690">https://bib.irb.hr/lista-radova?autor=299690</a>	Senior research associate (associate professor); interdisciplinary scientific area / fields: graphic technology, information and communication	10/1	3	1/1	1/1	1/1	Market communications management (Consultation)	0
							Workload in 1st and 2nd cycle	
							Total workload	0
Zjakić Igor University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=277915">http://bib.irb.hr/lista-radova?autor=277915</a>	Research adviser (associate professor) area: technical sciences / field: graphic technology	11/2	11	14/21	2/2	2/3	Advanced printing systems (Consultation)	20
							Screening elements in print (Consultation)	0
							Workload in 1st and 2nd cycle	363
							Total workload	383
Žiljak Stanimirović Ivana University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=259713">http://bib.irb.hr/lista-radova?autor=259713</a>	Research adviser (associate professor) area: technical sciences / field: graphic technology	13/3	9	5/12	2/2	2/4	Design of security graphics (Consultation)	0
							Computer typography (Consultation)	30
							Workload in 1st and 2nd cycle	315
							Total workload	345

Žiljak Vilko University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=63926">http://bib.irb.hr/lista-radova?autor=63926</a>	Professor emeritus	15/3	7	5/12	2/2	2/3	Computer image processing (Consultation)	30
							Workload in 1st and 2nd cycle	
							Total workload	30
Žiljak Vujić Jana Zagreb University of Applied Sciences <a href="http://bib.irb.hr/lista-radova?autor=264064">http://bib.irb.hr/lista-radova?autor=264064</a>	Research adviser (associate professor) area: technical sciences / field: graphic technology	37/7	9	2/7	1/1	2/2	Society, science and technology (Consultation)	0
							Workload in 1st and 2nd cycle	
							Total workload	0

\* State only for those coming from other institutions.

\*\* Or some other database showing accurate data on publications and other research results.

\*\*\* Workload expressed in norm hours at all three cycles of higher education and other HEIs.

A = number of publications (books, journal articles etc.) relevant for the area/field, according to the Ordinance on Election into Scientific Titles, in the past five years (CROSBI has to be updated to provide accurate information).

A1 = number of publications in WoS, Scopus databases

B = number of citations, if applicable, and the source of this information (e.g. WoS, Scopus, Google Scholar).

C = *h*-index (if applicable; also state the source of this information)

D = *h*-index of all publications in WoS/Scopus databases

**Table 2 Supervisors and candidates**

Supervisor Institution* Link to CROSBİ database**	Scientific (or scientific-teaching) title and area/field of election	Workload in norm-hours***	A	A1	B	C= h index WoS/Scopus	D	E	Candidate (initials) and research topic	F	F1	Number of candidate s ****
Babić Darko – retired professor									Pasanec Preprotić Suzana -15.2.2012. Čvrstoća knjižnog bloka u ovisnosti o starenju/Book strength in relation to the ageing process	13	8	2/0
									Jurečić Denis – 23.12.2015. Istraživanje čvrstoće ambalaže od valovitog kartona u kondicioniranim uvjetima/ The research strength of the packaging of corrugated cardboard in terms of conditioned	19	17	
Barbarić-Mikočević Željka University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=172095">http://bib.irb.hr/lista- radova?autor=172095</a>	Research adviser; (associate professor); area: technical sciences / field: graphic technology	197,5	5	5	12/12	1/1	-	3	Ivana Plazonić – 29.04.2014. Slama žitarica kao alternativni izvor vlakana u izradi papira za novinski tisak/Grain straw as an alternative source of fibers for coldset paper production	14	13	1/0
Bolanča Zdenka – retired professor									Sindić Igor – 30.6.2015. Karakteristike ink jet otisaka izloženih kontroliranim utjecajima vanjske atmosfere /Characteristics of Inkjet prints exposed to controlled influences of outdoor atmosphere	8	6	1/0
Bolanča Mirković Ivana University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=255110">http://bib.irb.hr/lista- radova?autor=255110</a>	Senior research associate (associate professor); area: technical sciences / field: graphic technology	202,5	6/2	4	3/5	1/2	-	2	Goran Medek Defended thesis Kartonska ambalaža i utjecajni čimbenici ekološke održivosti / Cardboard packaging and influential factors of environmental sustainability	1	1	0/1



Brozović Maja University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=211142">http://bib.irb.hr/lista-radova?autor=211142</a>	Research adviser; (full professor); area: technical sciences / field: graphic technology	312	3/2	1	1/1	1/1			Kovačević Dorotea Defended thesis Model grafičkog oblikovanja piktograma sigurnosnih piktograma na ambalaži / Model of graphic design of safety pictograms on the packaging	5	4	0/2
									Josip Bota Defended thesis Optimizacija i poboljšanje svojstava premazane kartonske ambalaže s obzirom na oblikovanje/Optimization of coated paperboard packaging properties according to design	1	1	
Džimbeg-Malčić Vesna University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=68182">http://bib.irb.hr/lista-radova?autor=68182</a>	Research adviser; (associate professor); area: technical sciences / field: graphic technology	267	8/3	6	12/12	1/1	-	3	Dujmušić Dorela Enrolled as a doctoral student in the academic year 2014/2015 Study advisor / prospective supervisor	1	1	0/0
Gojo Miroslav – retired professor									Tomislav Cigula - 5.12.2011. Kvalitativna analiza slobodnih površina tiskovnih formi /Quality analysis of the nonprinting areas on printing plates	36	15	
Lovreček Mladen – retired professor									Golob Gorazd 31.1.2011. Promjena površinske energije elastomera primjenom kisikove i dušikove plazme uz lasersku deaktivaciju površine/Elastomer surface energy modification applying oxygen and nitrogen plasma treatment with laser deactivation of the surface	21	6	1/0

Lozo Branka University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=172126">http://bib.irb.hr/lista-radova?autor=172126</a>	Full professor; area: technical sciences / field: graphic technology	375	11/6	7	2/5	1/1	4	2	Maja Jakovljević obranjena tema Termokromne tiskarske boje na bazi tekućih kristala/ Liquid crystal - based thermochromic printing inks	6	3	1/1
									Sonja Jamnicki - 27.4.2011. Evaluacija prikladnosti različitih klasa recikliranih papira za izradu zdravstveno ispravne prehrambene ambalaže/ Suitability evaluation of different recovered paper grades for production of health safe food packaging	8	5	
Mahović Poljaček Sanja University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=273165">http://bib.irb.hr/lista-radova?autor=273165</a>	Research adviser (associate professor) area: technical sciences / field: graphic technology	345	11/7	6	4/7	2/2	1	6	Tomašegović Tamara -22.3.2016. Funkcionalni model procesa izrade fotopolimerne tiskovne forme/ Functional model of photopolymer printing plate production process	11	11	1/0
Majnarić Igor University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=245651">http://bib.irb.hr/lista-radova?autor=245651</a>	Senior research associate (assistant professor); area: technical sciences / field: graphic technology	410	11/3	10	5/7	2/2	0	3	Marko Morić Enrolled as a doctoral student in the academic year 2015/2016 Study advisor / prospective supervisor	6	2	0/0
Mandić Lidija University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=211640">http://bib.irb.hr/lista-radova?autor=211640</a>	Research adviser (associate professor); area: technical sciences / field: graphic technology	315	14/10	5	13/27	2/1	4	6	Poljičak Ante - 30.6.2011. Zaštita vlasništva reproducirane slike umetanjem digitalnog vodenog žiga/ Copyright protection of a reproduced image with the implementation of a digital watermark	5	5	1/0
Mikota Miroslav Sveučilište u Zagrebu Grafički fakultet <a href="http://bib.irb.hr/lista-radova?autor=197062">http://bib.irb.hr/lista-radova?autor=197062</a>	Research associate (assistant professor); area: technical sciences / field: graphic technology	710	8	2	0/0	0/0	-	2	Mario Periša Enrolled as a doctoral student in the academic year 2009/2010 Study advisor / prospective supervisor	19	2	0/0

<p>Milčić Diana University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=213596">http://bib.irb.hr/lista-radova?autor=213596</a></p>	<p>Research adviser (full professor); area: technical sciences / field: graphic technology</p>	195	6/7	3	0/0	0/0	1	6	<p>Bratić Diana - 17.3.2015. Optimizacija procesa tiska na načelima Six Sigma/Optimization of the printing process on the principles of Six Sigma</p>	6	3	1/1
									<p>Borković Jakov Defended thesis Modeliranje integralnoga sustava upravljanja kvalitetom u novinskoj tiskari/ Design of the integrated quality management system in the printing plant</p>	2	0	
<p>Modrić Damir University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=147255">http://bib.irb.hr/lista-radova?autor=147255</a></p>	<p>Research adviser (assistant professor); area: technical sciences / field: graphic technology</p>	375	6/2	5	4/5	1/1	-	2	<p>Katja Petric Maretić - 25.2.2013. Implementacija Lorentzove funkcije u modeliranju reflektancijskoga profila slikovnog elementa / Implementation of the Lorentz function in the modeling of imaging element reflectance profile</p>	9	7	2/0
									<p>Katarina Itrić – 25.2.2016. Primjena gradijentne metode u razdvajanju komponenata prirasta rastertonske vrijednosti = Application of the gradient method in the component separation of dot gain</p>	3	3	
									<p>Snježana Ivančić Valenko Enrolled as a doctoral student in the academic year 2015/2016 Study advisor / prospective supervisor</p>	2	2	

<p>Mrvac Nikola University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=211232">http://bib.irb.hr/lista-radova?autor=211232</a></p>	<p>Research adviser (full professor); interdisciplinary scientific area / fields: graphic technology, information and communication</p>	387	10/4	10	7/7	1/1	-	3	<p>Mario Tomiša – 22.3.2012. Određivanje kvalitativnih kriterija dizajna grafičkoga proizvoda u procesu grafičke komunikacije/Determination of qualitative design criteria of graphic products in the process of graphic communication</p>	2	2	5/1
									<p>Mile Matijević – 6.2.2013. Vizualni efekti proširivanja i simultanoga kontrasta u grafičkoj komunikaciji/Visual effects of spreading and simultaneous contrast in the graphic communication</p>	12	11	
									<p>Damir Vusić – 22.03.2012. Efekt neonskoga proširivanja boje u procesu grafičke reprodukcije/The neon colour spreading effect in the graphic reproduction process</p>	7	2	
									<p>Ivan Budimir – 24.2.2015. Nove varijacije Munker-Whiteovoga efekta u grafičkoj komunikaciji/New variations of Munker-White effect in the process of graphical communication</p>	5	0	
									<p>Dario Čerepinko – 30.9.2014. Optimizacija grafičkih parametara korisničkoga sučelja za 'tablet novine'/Optimization of graphic parameters of user interface for tablet newspapers</p>	7	2	
									<p>Hajdek Krunoslav Defended thesis Akromatske reprodukcije uvjetovane manifestacijom pozadinskih efekata/Achromatic reproductions conditioned with manifestation of background effects</p>	5	0	

Pap Klaudio University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=162136">http://bib.irb.hr/lista-radova?autor=162136</a>	Research adviser (full professor); area: engineering sciences / field: graphic technology	315		3	5/12	2/2	-	3	Lajković Josipa – 30.6.2014. Modeliranje virtualne tiskare / Modeling of virtual printing house	8	4	2/1
									Sanja Brekalo – 27.11.2015. Optimizacija digitalne grafičke pripreme korištenjem skriptnih jezika/Digital prepress optimisation using scripting languages	2	1	
									Turčić Maja Defended thesis Optimizacija matematičkog sloga u e- knjigama /Mathematical typesetting optimization in e-books	8	0	
Pibernik Jesenka University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=226815">http://bib.irb.hr/lista-radova?autor=226815</a>	Research adviser (associate professor); area: engineering sciences / field: graphic technology	320	7/7	6	0	0	4	3	Jurica Dolić Model grafičkog znakovnog sustava za osobe sa složenim komunikacijskim potrebama = Model of graphic sign system for people with complex communication needs	4	4	2/0
									Filip Cvitić Dizajn dvodimenzionalnoga matričnoga bar koda pomoću QR koda/Two- dimensional matrix bar code design using a QR code	2	0	
Plenković Mario – retired professor									Daria Mustić – 27.11.2012. Modeli grafičkoga oblikovanja medijskih konvergiranih sadržaja/Models of graphic design of media convergent content	7	5	1/0

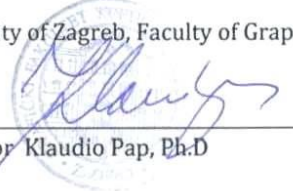
<p>Zjakić Igor University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=277915">http://bib.irb.hr/lista-radova?autor=277915</a></p>	<p>Research adviser (associate professor) area: engineering sciences / field: graphic technology</p>	383	11/2	11	14/21	2/2	-	2	<p>Eduard Galić Defended thesis Kolorimetrija spotnih boja različitih postupaka lakiranja/Colorimetry of spot colours of different varnishing methods</p>	7	6	5/1
									<p>Martina Skenderović Božičević – 10.2.2016. Primjena Ramanske spektroskopije i energetske disperzivne fluorescencije rendgenskih zraka u forenzičnoj analizi krivotvorenih novčanica/Application of raman spectroscopy and energy dispersive x ray fluorescence in the forensic examination of counterfeit banknotes</p>	1	1	
									<p>Dean Valdec – 26.11.2013. Utjecaj promjenjivih parametara fleksotiska na geometriju rasterskoga elementa predotisnute tiskovne podloge/The influence of variable parameters of flexographic printing on dot geometry of pre-printed printing substrate</p>	14	1	
									<p>Eugen Dobrić – 31.10.2013. Studija deformacije rasterskih elemenata hibridnoga rastriranja u novinskom tisku/The study of screen elements deformation of hybrid screening in newspaper print</p>	5	3	
									<p>Siniša Bogdanović – 2.9.2015. Kolorimetrijske karakteristike graničnog područja digitalnih tehnika tiska/Colorimetric characteristics of border area in digital printing techniques</p>	7	4	
									<p>Irena Bates – 21.2.2013. Studija specifičnih parametara reprodukcije fleksografskog tiska/The study of flexographic print reproduction specific parameters</p>	14	6	

<p>Žiljak Stanimirović Ivana University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=259713">http://bib.irb.hr/lista-radova?autor=259713</a></p>	<p>Research adviser (associate professor) area: engineering sciences / field: graphic technology</p>	345	13	9	5/12	2/2	-	3	<p>Branka Morić Kolarić – 18.9.2013. Razvoj elemenata zaštite dokumenata separacijom boja za ultraljubičasti, vidljivi i bliski infracrveni spektar /Development of document protection elements with the separation of colors for ultraviolet, visible and near infrared spectrum</p>	5	3	1/1
									<p>Martina Friščić Defended thesis Infracrvena zaštitna grafika u fleksotisku savitljive ambalaže sa spot I procesnim bojilima/Infrared security graphics in flexographic printing on flexible packaging with spot and process inks</p>	11	5	

Žiljak Vilko University of Zagreb Faculty of Graphic Arts <a href="http://bib.irb.hr/lista-radova?autor=63926">http://bib.irb.hr/lista-radova?autor=63926</a>	Professor emeritus	30	15	7	5/12	2/2	-	3	Maja Rudolf – 19.6.2013. Zaštitna grafika poštanskih maraka dualnim svojstvima bojila sa parametrom Z i individualiziranim rasterskim elementom /Postage stamp security graphics by dual ink properties with parameter z and individualized screening elements	10	1	3/2
									Ivan Rajković Defended thesis Digitalna video reprodukcija u grafičkoj tehnologiji za vizualni i infracrveni spektar/ Digital video reproduction in graphic technology for visual and infrared spectrum	8	0	
									Maja Matas Defended thesis Blizanci bojila za sigurnosni tisak u infracrvenoj kartografiji/ Twin dyes for security printing in infrared mapping	8	2	
									Petar Miljković – 19.3.2012. Model integracije digitalnih radnih tokova revijalne proizvodnje/Integration model of digital web offset workflows	15	3	
									Petra Poldrugač – 27.4.2011. Unapređenje metode otkrivanja krivotvorenih grafika iz područja vrijednosnica/Improvement methods of detecting counterfeit graphics in the field of securities	5	0	

Zagreb, April 28<sup>th</sup> 2016

University of Zagreb, Faculty of Graphic Arts  
 Dean:

  
 Professor Klaudio Pap, Ph.D