



POLITECHNIKA WARSZAWSKA

Agreement on  
Dual Degree Master Program in Computer Science

between

Politechnika Warszawska

Faculty of Electronics and Information Technology

and

Technische Universität Berlin

School of Electrical Engineering and Computer Science

## **1 Subject of the agreement and aims**

This agreement describes the academic and administrative conditions concerning the realization of a dual degree program supporting the exchange of students between Politechnika Warszawska (Warsaw University of Technology, WUT), Faculty of Electronics and Information Technology, and Technische Universität Berlin (TUB), School of Electrical Engineering and Computer Science. The aim is to enable TUB students of Computer Science and WUT students of Electrical and Computer Engineering (ECE) as well as WUT students of Computer Science to receive degrees of both universities. This is based on the principle that the participating students have to fulfill the requirements of both study programs.

## **2 Academic conditions**

### **2.1 Scope of agreement**

This agreement applies to TUB students in the Master Program in Computer Science (CS) and WUT students in the Master Program in Electrical and Computer Engineering (ECE) or in the Master Program in Computer Science, who are well-versed in the English language, as demonstrated by a TOEFL test (a minimum of 83 internet-based test points or 560 paper-based test points) or B-2 level university exam (at least grade B).

### **2.2 Admission procedure**

Both parties guarantee that participants of the dual degree program will be selected according to their academic, personal, and linguistic qualifications. To enter the dual degree master program, students first have to be admitted to the Master Program in CS or ECE, respectively, at their *home institution*. Not later than in their first year, students can apply for the dual degree master program. Applications are evaluated first by the *home institution* and then presented to the partner institution (which will become the student's *host institution*) for review and approval. To be admitted to the program, students must meet all graduate admission policies at both institutions, and must have advisors who agree to advise them at both institutions.

### **2.3 Exchange contingent**

Up to five students are to be accepted by the host institution per year.

### **2.4 Acknowledgment of student's achievements on entering the dual degree program**

On the assumption of fundamental equivalence and based on mutual trust in the academic quality of the host university's curriculum, it is agreed that

- WUT acknowledges the qualification for entrance to TUB CS Master Program.
- TUB acknowledges the qualification for entrance to WUT ECE or WUT CS Master Program.

### **2.5 Student supervision**

Students will have an advisor at WUT and an advisor at TUB. After being accepted to the dual degree program, the student has to select an advisor at the home university in the desired field of specialization. In discussion with this advisor, a co-advisor in the same research area at the host university has to be found, who is willing to supervise the student's master thesis.

### **2.6 Curricular conditions**

**Period of study.** The standard period of study is four semesters, consisting of three semesters of course work, and a master thesis. The first two semesters are studied at the home institution, the two last semesters are taken at the host institution.



However, student may have to pay a small student registration fee at the host institution. The host university will arrange for accommodation in a student dormitory, if wanted and possible. Participants of the dual degree program are responsible for their own travel and living expenses during the exchange, if there is no third party funding. The home as well as the host institution will, however, try to get financial support to defray all or part of those expenses.

## Appendix A: Overview of the Curricula at WUT and TUB

WUT Electrical and Computer Engineering specialization: Computer Systems and Networks (ECE-CSN)					
	Semesters:	1	2	3	4
Groups of courses		ECTS credits			
CSN Fundamentals		36			
CSN Advanced Courses		42			
General Studies: Mathematics (D)		6			
General Studies: Non-ECE Electives		3			
M.Sc. Diploma Project & Seminar		33 (30 from M.Sc. Thesis and 3 from a seminar)			
	$\Sigma$	33	30	30	27

### Specialization areas in WUT ECE master Program:

- Computer Systems and Networks (CSN)
- Telecommunications (TCM)

WUT Computer Science (in Polish) specialization: Computer Information System Engineering (CS-ISI)					
	Semesters:	1	2	3	4
Groups of courses		ECTS credits			
ISI Fundamentals		30			
Advanced Technical Courses		32 (includes 20 from ISI Advanced Courses + 8 from General Advanced Courses)			
Non-technical courses		6			
M.Sc. Research Projects		16			
M.Sc. Diploma Projects & Seminars		39 (33 from M.Sc. Thesis and 6 from 2 seminars)			
	$\Sigma$	30	30	30	30

### Specialization areas in WUT CS master Program:

- Computer Information System Engineering<sup>1</sup> (ISI)
- Information and Decision Systems<sup>2</sup> (SID)

<sup>1</sup> in Polish: Inżynieria Systemów Informatycznych

<sup>2</sup> in Polish: Systemy Informacyjno-Decyzyjne

TUB Computer Science				
Semesters:	1	2	3	4
Courses (or groups of courses)	ECTS credits			
Major Studies (CS)	54-60 (at least 30 from IS)			
Minor Studies	18-24			
General Studies	12-18			
M.Sc. Thesis				30
	$\Sigma$	30	30	30

**Specialization areas in TUB CS master Program:**

- System Engineering (SE)
- Dependable Systems (DS)
- Intelligent Systems (IS)
- Communication based Systems (CBS)

## Appendix B: Special curricular regulations for the DD-program

The following regulations and lists are based on the current offer of English courses at the two institutions which is subject to change. The two institutions will update the lists accordingly.

### B1. TUB requirements on Minor and General studies:

The TUB-CS program requires credit points in a minor subject (at least 18 ECTS) and in General Studies (at least 12). The goal of *General Studies* is to round off the graduate's competences and enable them to acquire other knowledge that will be useful in their future careers or for their academic qualification. In the spirit of this agreement both parties believe that the very participation in this program with its intercultural experience strongly contributes to this goal. The TUB requirements on General Studies are therefore relaxed for participants of this program in that way that the required 12 ECTS can also be taken from CS in order to fulfill the other requirements. The rationale behind the requirement for a *minor subject* is the observation that the practical work of a CS graduate usually takes place in some application context and means working in multidisciplinary teams. Taking a minor subject will provide the graduate with the basic knowledge and the scientific approach of at least one field other than computer science.

TUB-CS students are encouraged to keep their field of minor studies they selected in the bachelor program. They should try to finish the requirements of the minor studies during their first year at their home university.

WUT students should take benefit from the opportunity to define an individually composed minor field of at least 18 ECTS. Table 1 lists WUT courses that may be taken as part of a minor subject entitled either "Scientific Methodology" or "Topics in Social Sciences".

WUT				
category	course name	ECTS	comment	Minor Subject
General Studies: Non-ECE Electives	Academic Writing	3		Scientific Methodology
	Culture and Tradition	3		Scientific Methodology
	Ethical Aspects of Research and Engineering	3		Scientific Methodology
	Introduction to Sociology	3		Scientific Methodology
	Quality Management	3		Scientific Methodology
General Studies: Mathematics (D)	Discrete Random Processes	6	only in Winter term	Scientific Methodology
CSN Advanced Courses	Parallel Numerical Methods	6	only in Winter term	Scientific Methodology
Non-technical courses	Team Building	3	in Polish	Topics in Social Sciences
	Philosophy of Globalism	3	in Polish	Topics in Social Sciences
	Free-Market Economy - Case of Europe	3	in Polish	Topics in Social Sciences
	Sociological Perspective on Political Marketing	3	in Polish	Topics in Social Sciences
	Problems of Western Civilisation	3	in Polish	Topics in Social Sciences
	Social Acceptation - Projecting and Achieving	3	in Polish	Topics in Social Sciences
	Law Regulations in Telecommunication	3	in Polish	Topics in Social Sciences
	Social Aspects of Modern Technological Changes	3	in Polish	Topics in Social Sciences
	Ways of Making Decision	3	in Polish	Topics in Social Sciences
General Advanced Courses	Stochastic Processes	4	in Polish	Scientific Methodology

**Table 1:** WUT courses for TUB minor studies

## B2. Mutual recognition of courses with regard to the general competence goal

The following tables indicate which courses from the one institution are recognized by the other institution and in which category they fit. Note that the TUB program requires 30 ECTS taken from IS specialization (Intelligent Systems) area. Possible conflicts of TUB courses with WUT courses will be checked based on the individual study programs.

WUT				TUB
category	course name	ECTS	comment	category
CSN Advanced Courses	Image and Speech Recognition	6	only in Winter term	IS
CSN Advanced Courses	Pattern Recognition	6	only in Spring term	IS
CSN Advanced Courses	Data Mining	6	only in Spring term	IS
CSN Advanced Courses	Evolutionary Algorithms	6	only in Spring term	IS
CSN Advanced Courses	Cryptography and Data Security	6	only in Spring term	DS
CSN Advanced Courses	Digital Signal Processor Architecture and Programming	6	only in Winter term	SE
CSN Fundamentals	Computer Architecture	6		SE
ISI Advanced Courses	Pattern Recognition	5	in Polish	IS
ISI Advanced Courses	Data Mining	4	in Polish	IS
ISI Advanced Courses	Introduction to Text Mining in Internet	4	in Polish	IS
ISI Advanced Courses	Intelligent Information Systems	4	in Polish	IS
ISI Advanced Courses	Bioinformatics Methods	4	in Polish	IS
ISI Advanced Courses	Modern Heuristic Techniques	5	in Polish	IS
ISI Advanced Courses	Digital Image Processing	5	in Polish	IS
ISI Advanced Courses	Image Processing	5	in Polish	IS
ISI Advanced Courses	Distributed Operating Systems	4	in Polish	SE
ISI Advanced Courses	Distributed Systems	4	in Polish	SE
ISI Fundamentals	Data Bases 2	5	in Polish	IS
M.Sc. Research Projects	M.Sc. Research Project 1	8	in Polish	IS
M.Sc. Research Projects	M.Sc. Research Project 2	8	in Polish	IS
General Advanced Courses	Semantic Analysis of Images and Sounds	4	in Polish	IS
General Advanced Courses	Artificial Intelligence Methods	4	in Polish	IS
General Advanced Courses	Database Query Optimization	4		IS

**Table 2:** Recognition of WUT courses at TUB

In Table 3, we place TUB courses which can be recognized as replacement for advanced and fundamental WUT ECE-CSN courses (WUT CSN students can transfer 36 ECTS of fundamental courses from their bachelor of engineering program).

TUB				WUT
category	course name	ECTS	comment	category
IS	Introduction to Neural Information Processing	6	only in winter term	CSN Advanced Courses
IS	Advanced Neural Information Processing	6		CSN Advanced Courses
IS	Neural Information Processing Project	9		CSN Advanced Courses
IS	Project Hot Topics in Computer Vision	6		CSN Advanced Courses
IS	Seminar Hot Topics in Computer Vision	6		CSN Advanced Courses



IS	Photogrammetric Computer Vision	9	only in winter term	CSN Advanced Courses
IS	Probabilistic and Bayesian Modelling in Machine Learning and Artificial Intelligence	6	only in summer term	CSN Advanced Courses
IS	Hot Topics in Machine Learning and Artificial Intelligence	6		CSN Advanced Courses
DS	Verification of Security Protocols	9	only in winter term	CSN Advanced Courses
IS	Topics in Cognitive Science	6		CSN Advanced Courses
IS	Automatic Image Analysis	6	only in winter term	CSN Fundamentals
IS	Digital Image Processing	6	only in summer term	CSN Fundamentals
IS	Photogrammetric Computer Vision	6	only in winter term	CSN Fundamentals
IS	Enterprise Architecture	6		CSN Fundamentals
IS	Knowledge Networks and Semantic Databases	6		CSN Fundamentals
CBS	Protocol Design	6	only in winter term	CSN Fundamentals
CBS	Network Architectures – Project	12		CSN Fundamentals
CBS	Network Architectures – Router Lab	6	only in summer term	CSN Fundamentals
CBS	Network Architectures – Specialization (big)	9	lasts 2 semesters	CSN Fundamentals
CBS	Network Architectures– Specialization (small)	6	lasts 2 semesters	CSN Fundamentals
SE	Operating Systems II	12	lasts 2 semesters	CSN Fundamentals
SE	Operating Systems Project	6		CSN Fundamentals

**Table 3:** Recognition of TUB courses at WUT

## Appendix C: Grading scheme

German grades for courses taken at TUB will be translated to Polish grades in the following way:

TUB Grades	WUT Grade
1,0 and 1,3	5,0
1,7 and 2,0	4,5
2,3 and 2,7	4,0
3,0 and 3,3	3,5
3,7 and 4,0	3,0
5,0 (failed)	2,0 (failed)

Polish grades for courses taken at WUT will be translated to German grades in the following way:

WUT Grade	TUB Grade
5,0	1,0
4,5	1,7
4,0	2,3
3,5	3,0
3,0	3,7
2,0 (failed)	5,0 (failed)

Based on these numerical grades the final result for the study program will be calculated according to the respective regulations at WUT and TUB.