

Certificate Number: 22/2018/ITK
Institution Identification Number: FI79633

HUQF Level: 6
EQF Level: 6

DEGREE CERTIFICATE

It is hereby certified that

HAKKEL Tamás

(born Hakkel Tamás, on 5 July 1994 in Budapest, Hungary)
having completed an approved joint **bachelor's degree** programme
and fulfilled the academic requirements of the

Pázmány Péter Catholic University and the Semmelweis University

was duly admitted to the degree of **Bachelor of Science** in

Molecular Bionics Engineering

and has qualified as a(n)

Molecular Bionics Engineer.

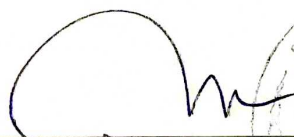
The duration of the programme of study was 7 semesters.

The academic records were kept by the

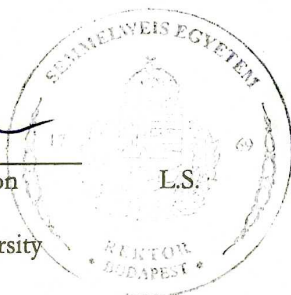
Pázmány Péter Catholic University.

Overall classification of the qualification: **honours.**

Budapest, 30. January 2018.



Dr. SZÉL Ágoston
President
Semmelweis University



Dr. SZUROMI Szabolcs
President
Pázmány Péter Catholic University

DIPLOMA SUPPLEMENT



Number of diploma in the registry of diplomas: 22/2018/ITK

1. HOLDER OF THE QUALIFICATION

1.1. Family name(s)
Hakkel

1.2. Given name(s)
Tamás

1.3. Born country, Born place, Date of birth
(day/month/year)
Hungary, Budapest, 05.07.1994

1.4. Student identification number
77434830755

1.5. Registration number
T017827/FI79633

2. INFORMATION ON IDENTIFYING OF THE QUALIFICATION

2.1. Name of qualification and (if applicable) title conferred
Molecular Bionics Engineer

2.2. Main field(s) of study for the qualification
Molecular Bionics Engineering

2.3. Name and status of awarding institution
Pázmány Péter Catholic University (FI79633)
Church University, Has been accredited by the Hungarian Accreditation
Committee (MAB) by resolution, reference number 2015/9/V/2.

2.4. Name and status of institution (if different from 2.3) administering studies

2.5. Language(s) of instruction/examination
Hungarian

3. INFORMATION ON THE LEVEL OF THE QUALIFICATION

3.1. Level of qualification
BA/BSc

EQF level
6

3.2. Official length of program
7 semesters

3.3. Access requirements
Entrance procedure

4. INFORMATION ON THE CONTENTS AND RESULTS GAINED

4.1. PROGRAM REQUIREMENTS

4.1.1. Program requirements act number

Ministry of Education Decree (15/2006.(IV.3.) on National Qualification and Outcome Requirements of Bachelor programs

4.1.2. Aim of study

The objective of the program is to form bionic engineers who acquire the selective fundamentals and experiment methodology of biology, molecular physics and chemistry, electronics and computer engineering as well as medical sciences and who are able to integrate these into their theoretic and practical work. They are capable of applying their knowledge within the wide scope of pharmaceutical, medical biotechnological and medical bioelectrical, nano-technological, bio-prosthetic, bio-imaging appliances industries and in other related industries (environmental and health protection, industrial safety and nature protection, personal and civil protection, personalized medical and pharmaceutical technologies). They will be able to operate high-valued machinery on two levels in healthcare and industrial applications and possess the deep enough knowledge base to continue their studies in the second tier.

4.1.3. Required number of credit points

210

4.1.4. System of knowledge checking

examinations, completing practical requirements, one comprehensive examination, preparation of a thesis and its open oral defence at a course closing examination

4.1.5. Required professional practice, credit value

The curriculum of the Molecular bionics engineer BSc does not require traineeship. The program ensures that the students get familiar with the practical aspects of a given well-defined area during tutored research projects.

4.2. PROGRAM DETAILS AND THE INDIVIDUAL GRADES / MARKS / CREDITS OBTAINED

4.2.1. Knowledge acquired during the programme of study (requirement designation, credit points, marks)

Subject	Subject code	Lessons	Requirement	Credit	Grade	Term
Refresher Course in Physics	P-ITFIZ-0001	W: 1/2/0	Teacher's signature	0	Teacher's signature	2014/15/1
Fundamental Chemistry	P-ITBIO-0000	W: 2/0/0	Teacher's signature	0	Teacher's signature	2014/15/1
Refresher Course in Mathematics	P-ITMAT-0000	W: 0/2/0	Teacher's signature	0	Teacher's signature	2014/15/1
Academic Writing	P-ITMUV-0002	W: 2/0/0	Term mark	2	Excellent	2014/15/1
Mathematical Analysis I.	P-ITMAT-0001A	W: 3/2/0	Exam	6	Excellent	2014/15/1
The World of Molecules (Molecular Physico-Chemistry)	P-ITBIO-0001	W: 4/2/2	Exam	10	Excellent	2014/15/1
Linear Algebra I.	P-ITMAT-0003A	W: 2/2/0	Exam	5	Excellent	2014/15/1
Cultural history of Physics	P-ITMUV-0003	W: 2/0/0	Term mark	2	Excellent	2014/15/1
Introduction to Programming	P-MB_B9	W: 1/0/3	Term mark	4	Excellent	2014/15/1
Discrete Mathematics I.	P-ITMAT-0006A	W: 1/1/0	Exam	2	Excellent	2014/15/1

Subject	Subject code	Lessons	Requirement	Credit	Grade	Term
Physical education I.	P-ITEGY-0001	W: 0/2/0	Teacher's signature	0	Teacher's signature	2014/15/1
Introduction to Electrical Measurements	P-MB_B2_4	W: 1/0/3	Term mark	4	Excellent	2014/15/2
Introduction to Matlab Programming	P-ITMAT-0014	W: 0/0/2	Term mark	2	Excellent	2014/15/2
Biochemistry	P-ITBIO-0003	W: 2/0/2	Exam	5	Excellent	2014/15/2
Classical Physics	P-ITFIZ-0002	W: 4/0/0	Exam	4	Excellent	2014/15/2
Discrete Mathematics II.	P-ITMAT-0006B	W: 1/1/0	Exam	3	Excellent	2014/15/2
Organic Chemistry	P-ITBIO-0002	W: 2/0/2	Exam	5	Excellent	2014/15/2
Mathematical Analysis II.	P-ITMAT-0001B	W: 3/3/0	Exam	7	Excellent	2014/15/2
Linear Algebra II.	P-ITMAT-0003B	W: 2/2/0	Exam	5	Excellent	2014/15/2
Introduction to Programming II.	P-MIB_T8B	W: 1/0/3	Term mark	4	Excellent	2014/15/2
Mathematics Comprehensive	P-ITSZM-0000	S:	Comprehensive exam	0	Excellent	2015/16/1
Teaching	P-ITGYV-0002A	W: 0/2/0	Term mark	2	Excellent	2015/16/1
Probability, statistics	P-ITMAT-0004	W: 3/2/0	Exam	6	Excellent	2015/16/1
Molecular biology and genetics of the cell I	P-MB_A5A	W: 2/2/0	Exam	5	Excellent	2015/16/1
Introduction to Information Technology	P-ITSZT-0011	W: 0/0/2	Term mark	2	Excellent	2015/16/1
Data Structures and Algorithms	P-ITSZT-0012	W: 2/0/3	Exam	6	Excellent	2015/16/1
Introduction to Biophysics	P-MB_B7_4	W: 3/0/0	Exam	4	Excellent	2015/16/1
Bio- and Environmental Ethics I.	P-ITMUV-0008	W: 2/0/0	Exam	2	Excellent	2015/16/1
Basics of Economics	P-ITKOZ-0001	W: 4/0/0	Exam	5	Excellent	2015/16/1
Electrical networks -theory and computation	P-ITEEA-0009	W: 2/0/2	Exam	5	Excellent	2015/16/1
Mathematical analysis III.	P-ITMAT-0001C	W: 2/2/0	Exam	5	Excellent	2015/16/1
Teaching	P-ITGYV-0002B	W: 0/2/0	Term mark	2	Excellent	2015/16/1
Programming II.	P-MB_B10B	W: 0/0/2	Term mark	2	Excellent	2015/16/1
Complex biolaboratory I.	P-MB_B3A	W: 0/0/3	Term mark	3	Excellent	2015/16/2
Stochastic processes	P-ITMAT-0005	W: 2/1/0	Exam	4	Excellent	2015/16/2
Digital systems and computer architectures	P-ITEEA-0004	W: 4/1/1	Exam	7	Excellent	2015/16/2
Java Programming	P-ITSZT-0006	W: 0/0/3	Term mark	3	Excellent	2015/16/2
Database management	P-MB_B6	W: 2/0/2	Exam	5	Excellent	2015/16/2
Teaching	P-ITGYV-0001A	W: 0/1/0	Term mark	1	Excellent	2015/16/2
Computing Sciences Comprehensive	P-MB_SZSZT	S:	Comprehensive exam	0	Excellent	2015/16/2
Digital Signal Processing	P-ITJEL-0026	W: 2/0/2	Exam	5	Excellent	2015/16/2
Functional Analysis	P-ITMAT-0007	W: 2/2/0	Exam	5	Excellent	2015/16/2
Physics of Information Technology and Bionics I.	P-ITFIZ-0006	W: 4/2/0	Exam	7	Excellent	2015/16/2
Molecular biology and genetics of the cell II.	P-MB_A5B	W: 2/2/0	Exam	5	Excellent	2015/16/2
Basics of Management	P-ITKOZ-0002	W: 4/0/0	Exam	5	Excellent	2015/16/2
Teaching	P-ITGYV-0001B	W: 0/1/0	Term mark	1	Excellent	2015/16/2

Subject	Subject code	Lessons	Requirement	Credit	Grade	Term
Introduction to Bioinformatics	P-ITBIO-0009	W: 2/0/2	Exam	5	Excellent	2016/17/1
Introduction to Law and Issues of Copyrights	P-ITKOZ-0003	W: 4/0/0	Exam	5	Excellent	2016/17/1
Basic Image Processing	P-ITJEL-0014	W: 2/1/1	Exam	5	Good	2016/17/1
Neural networks	P-ITEEA-0011	W: 2/2/0	Exam	5	Excellent	2016/17/1
Information and Coding Theory	P-ITTAV-0003	W: 4/1/0	Exam	6	Good	2016/17/1
Teaching	P-ITGYV-0002C	W: 0/2/0	Term mark	2	Excellent	2016/17/1
Teaching	P-ITGYV-0002D	W: 0/2/0	Term mark	2	Excellent	2016/17/1
Introduction to Neurobiology	P-ITBIO-0008	W: 3/2/0	Exam	6	Satisfactory	2016/17/1
Physics of Information Technology and Bionics II.	P-ITFIZ-0007	W: 3/1/0	Exam	5	Excellent	2016/17/1
Chamber Music I.	P-ITEGY-0033	W: 0/1/0	Term mark	1	Excellent	2016/17/1
Immunology	P-MB_C13	W: 2/0/0	Exam	3	Excellent	2016/17/1
Teaching	P-ITGYV-0002E	W: 0/2/0	Term mark	2	Excellent	2016/17/2
Medical Biology	P-MB_C20	W: 1/0/0	Exam	1	Excellent	2016/17/2
Training on AFM	P-MB_L2	W: 0/0/1	Term mark	1	Excellent	2016/17/2
Teaching	P-ITGYV-0002F	W: 0/2/0	Term mark	2	Excellent	2016/17/2
Individual laboratory MBE-BSc	P-MB_L1	W: 0/0/4	Term mark	4	Excellent	2016/17/2
Microelectronics	P-ITEEA-0010	W: 3/2/0	Exam	6	Excellent	2016/17/2
Cellular wave computers	P-ITEEA-0003	W: 2/2/0	Exam	5	Excellent	2016/17/2
Training on STM	P-MB_L3	W: 0/0/1	Term mark	1	Good	2016/17/2
Introduction to Functional Neurobiology	P-ITBIO-0021	W: 3/2/0	Exam	6	Good	2016/17/2
Biomedical Imaging	P-ITBIO-0004	W: 2/0/0	Exam	3	Excellent	2016/17/2
Dynamic Models in Biology	P-ITBIO-0005	W: 2/1/1	Exam	5	Excellent	2016/17/2
Electrophysiological Methods for the Study of the Nervous and Muscular Systems	P-ITBIO-0007	W: 2/0/2	Exam	5	Excellent	2016/17/2
English language credits	P-ITANG-0050	S:	Term mark	5	Excellent	2016/17/2
Chamber Music II.	P-ITEGY-0034	W: 0/1/0	Term mark	1	Excellent	2016/17/2
Training on fMRI	P-MB_L4	W: 0/0/2	Term mark	2	Excellent	2017/18/1
Computerised Systems Biology	P-MB_C21	W: 3/0/0	Exam	4	Excellent	2017/18/1
Physical education 2.	P-ITEGY-0002	W: 0/2/0	Teacher's signature	0	Teacher's signature	2017/18/1
FPGA-based Algorithm Design	P-ITEEA-0014	W: 2/0/2	Exam	5	Excellent	2017/18/1
Numerical Analysis I.	P-ITMAT-0009	W: 2/0/1	Exam	4	Satisfactory	2017/18/1
Teaching	P-ITGYV-0003A	W: 0/3/0	Term mark	3	Excellent	2017/18/1
Thesis Seminar	P-ITLTD-0001	W: 1/0/0	Teacher's signature	0	Teacher's signature	2017/18/1

*Lessons per week (W) / semester (S) *If the number of lessons contains / marks, like in le/p/ly, its meaning is: number of lectures/class practices/laboratories.

Number of credits:

277

4.2.2. Knowledge acquired earlier and during parallel or exchange programmes of study (requirement designation, credit points)

Subject name	Subject code	Recognised	Requirement	Credit	Grade	Date
Programming I.	P-MB_B10A	Accreditation within the HEI	Term mark	2	Excellent	12.19.2017

Number of credits:

2

4.2.3. Recognised knowledge acquired informally or during work and other experience (requirement designation, credit points)

Subject name	Subject code	Recognised	Requirement	Credit	Grade	Date
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Number of credits:

0

4.3. Grading scheme and, if available, grade distribution guidance

The grading scheme is identical with the one given in Section 8 hereunder.

In the five-grade scheme, grade 5 is the best grade, the minimum requirement is grade 2.

In the three-grade scheme grade 5 means excellent standing, grade 3 means passed, and is the minimum requirement.

4.4. Overall classification of the qualification

honours (4,97)

5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION

5.1. Access to further study

Programs requiring molecular bionics BSc, two master programs are open: the info-bionics and the medical biotechnology master programs

5.2. Professional status (if applicable)

6 ADDITIONAL INFORMATION

6.1. Information concerning the holder of the diploma

First place at the Faculty Research Student Conference in the first semester of 2017/2018. The owner of this certificate has received 15 credits for his/her diploma work. The total number of credits completed during the programme is 294.

6.2. Information on the Institution

<http://www.ppke.hu>

6.3. Further information sources

<http://itk.ppke.hu/en>

7. CERTIFICATION OF THE SUPPLEMENT

7.1. Date

25. 01. 2018

7.4. Official stamp or seal

7.2. Name and signature

Andrea Mihálffy

 Andrea Mihálffy

7.3. Capacity

Head of the Registrars' Office



8. INFORMATION ON THE HUNGARIAN HIGHER EDUCATION SYSTEM

(modified in May 2015)

8.1. Types of Institutions and Institutional Control

The establishment and operation of higher education institutions are regulated by Act No. 204 of 2011 (National Higher Education Act). Operating within the legal framework of the National Higher Education Act, Hungarian higher education institutions are recognized state (public) or non-state (church or private) institutions. The list of recognized institutions is indicated in Annex 1 of the National Higher Education Act. Higher education studies are offered at two types of higher education institutions, egyetem (university) and főiskola (college). Universities and colleges may offer courses in all three training cycles. The programmes are identical at both types of institutions.

8.2. Types of Programmes and Degrees Awarded

The consecutive training cycles of higher education leading to a higher education degree are alapképzés (Bachelor course), mesterképzés (Master course) and doktori képzés (Doctoral course). In cases set by government decree or legislation, Master degrees can also be awarded after the completion of integrated, one-tier training.

In addition to the aforementioned, higher education institutions may conduct non-degree vocational higher education programmes and postgraduate specialist trainings and may offer adult education within the framework of lifelong learning as well.

Higher education institutions apply a credit system based on the European Credit Transfer and Accumulation System. Accordingly, one credit stands for an average of 30 hours of student workload.

8.3. Approval/Accreditation of Programmes and Degrees

In the case of each vocational higher education programme, Bachelor and Master course, the programme and outcome requirements are set in legal regulations, i.e. the level of the training, the professional qualification that can be obtained and all the competencies the acquisition of which are the preconditions for obtaining the diploma in the given programme.

Upon request of the higher education institution, the Educational Authority – after having obtained the expert opinion of the Hungarian Accreditation Committee – licenses and registers the launching of all vocational higher education programmes, a Bachelor or Master courses or Doctoral schools. Also, the operating licenses of higher education institutions are revised by the Educational Authority in every 5 years, taking into account the expert opinion of the Hungarian Accreditation Committee. The above mentioned procedures apply for all recognized, state or non-state higher education institutions, except for religious studies, since the Hungarian Accreditation Committee and the Educational Authority have no competence over the quality assurance in this field. In the case of religious studies only the requirements in respect of infrastructure can be examined.

8.4. Organisation of Studies

Students studying in vocational higher education programmes, Bachelor and Master courses, as well as postgraduate specialist trainings complete their studies by passing a final examination. The final examination may consist of the defense of the degree thesis or diploma project, and additional oral, written or practical examinations.

8.4.1. Vocational Higher Education Programmes

From 1 September 2013 higher-level vocational training has been replaced by vocational higher education programmes. This type of training no longer forms part of the National Register of Vocational Qualifications.

The diploma obtained after the completion of a vocational higher education programme testifies a vocational higher education qualification, but it is not per se an academic degree. A vocational higher education programme requires the completion of 120 to 150 credits; generally the length of the programme is 4-5 semesters.

8.4.2. First/Second Cycle Degree Programmes

The first higher education degree is the alapképzés (Bachelor degree) ending in a professional qualification. A Bachelor course requires the completion of 180 to 240 credits. The length of the programme is 6-8 semesters.

The second higher education degree is the mesterképzés (Master degree) ending in a professional qualification. Based on a Bachelor course, Master courses require the completion of 60 to 120 credits. The length of the programme is 2-4 semesters.

8.4.3. Integrated Programmes

The integrated, one-tier programmes, which are based on the secondary school leaving examination (érettségi vizsga), lead to mesterképzés (Master degree), have the length of 10-12 semesters and require the completion of 300 to 360 credits. Besides teacher education, religious studies and some programmes of arts, e. g. the following programmes are offered as integrated programmes: veterinary medicine, architecture, dentistry, pharmaceuticals, law and medicine.

8.4.4. Specialised Graduate Studies

Higher education institutions may also offer szakirányú továbbképzés (postgraduate specialist training) for Bachelor and Master degree holders in this type of a training. Through the completion of 60 to 120 credits a specialised qualification can be obtained. The length of the programme is 2-4 semesters.

8.4.5. Doctoral Programmes

Based on a Master degree the doktori képzés (Doctoral course) requires the completion of at least 180 credits. The length of the programme is 36 months. Following the Doctoral course, or within the framework of the Doctoral course through a separate degree obtaining procedure, the scientific degree "Doctor of Philosophy" (abbreviation: PhD), or in the field of art

"Doctor of Liberal Arts" (abbreviation: DIA) may be obtained. The maximum length of the degree obtaining procedure is 2 years.

8.5. Grading Scheme

The performance of students is generally assessed following a five-grade scale: excellent (5), good (4), satisfactory (3), pass (2), and fail (1) or a three-grade scale: pass with merit (5), pass (3), and unsatisfactory (1). Nevertheless, higher education institutions may also use other systems for assessment if they are comparable to those mentioned above.

8.6. Access to Higher Education Programmes

The ranking of students applying for higher education programmes is primarily based on their secondary school grades and their érettségi vizsga (secondary school leaving examination) results or based solely on the latter. The requirement for admission to vocational higher education programmes, Bachelor and integrated Master courses is the secondary school leaving examination taken – as a rule – after the completion of the 12th grade of a secondary school, certified by the Érettségi bizonyítvány (secondary school leaving certificate). The admission to certain programmes may also be based on health or professional requirements or aptitude tests. To Master courses students holding a Bachelor degree can be admitted. To postgraduate specialist trainings students holding a Bachelor or a Master degree may be admitted. To Doctoral courses only applicants holding a Master degree can be admitted. Higher education institutions may set additional requirements for admission to Master, postgraduate specialist and Doctoral courses.

8.7. Additional Sources of Information

Hungarian ENIC/NARIC¹, Ministry of Human Resources², Educational Authority³, Hungarian Accreditation Committee⁴, Educatio⁵.

¹ Web site: www.naric.hu

² Web site: www.kormany.hu/hu/emberi-eroforrasok-miniszteriuma

³ Web site: www.oktatas.hu

⁴ Web site: www.mab.hu

⁵ Web site: www.felvi.hu