



Informatics Teachers Education in Bulgaria


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Agenda

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- Overview of the education in informatics area in Bulgarian schools

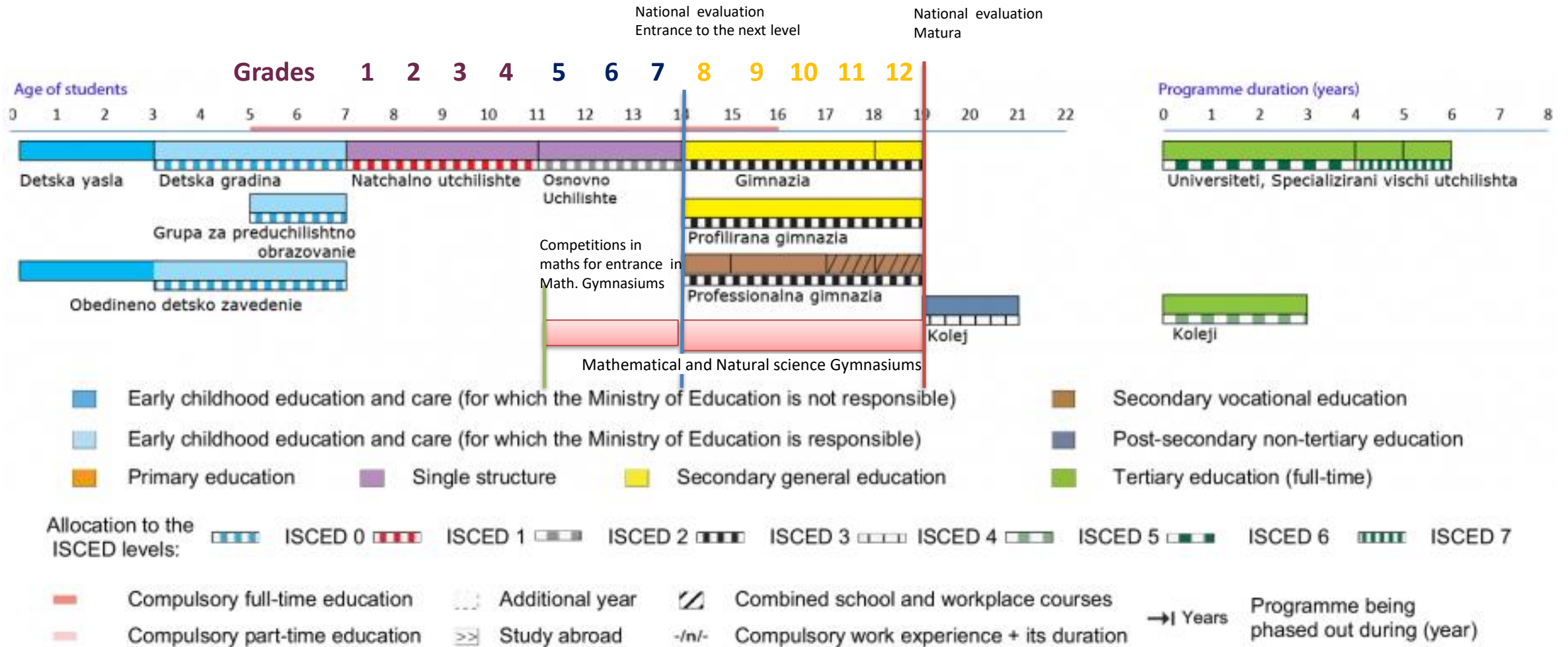
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- National regulations for teachers' education

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- Education of teachers in informatics and ICT – tracks and providers

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- Education of Teachers in Informatics at South-West University “Neofit Rilski”

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- Conclusions

Educational System in Bulgaria



Current School Subjects in Informatics

School Level	Compulsory	Elective/Optional
Primary – 3 rd – 4 th grade ISCED I	Computer modelling – from 2018/2019 – 1 hour per week (32/34 hours per year) – based on unplugged activities and block-based programming (Syllabuses were launched in 2016)	IT – from 2003/2004 , 1 or 2 hours per week, computer graphics, word-processing, presentations, internet, animations, now – computer modelling and robotics
Low Secondary - 5 th – 7 th grade ISCED II	Computer modelling and information technology , 2021/2022, 1,5 hour per week (51 hours per year) – ICT and programming in block-based and script programming languages(from 6 th grade)	IT – 1 or 2 hours per week Computer modelling Robotics, Animation, etc..
Upper Secondary school – 8 th – 10 th grade First gymnasium level ISCED III	Informatics - 8 th grade (for some schools – specialised in Math, Informatics, Natural Sciences,) – 2 hours per week – programming languages – C#, Java, or Visual Basic IT - 1 hour per week (at 10 th grade only one semester) – includes some topics in programming	Informatics IT
High School – 11 th -12 th grade Second Gymnasium level ISCED III	Modules for specialisation in <ul style="list-style-type: none"> Hardware and software sciences, Mathematics (four modules in Informatics, 2 hours p.w) ; Information technology, Entrepreneurships, Art and Music (4 in IT, 2 hours p.w) ; Vocational education in Programming	Informatics IT at least 4 hours per week in specialised schools

National regulations

For obtaining teachers qualification

- [ORDINANCE on the state requirements for acquiring professional qualification "teacher"](#)
- Description of competences of the teachers relevant to the school educational level and thought subjects

For teachers in subjects in informatics area in secondary and high school

- [ORDINANCE No 15 of 22.07.2019 on the status and professional development of teachers, principals and other pedagogical specialists](#)

For teachers in computer modelling in primary school

- [ORDINANCE No 15 of 22.07.2019 on the status and professional development of teachers, principals and other pedagogical specialists](#)

Accreditation by National Evaluation and Accreditation Agency

<https://www.neaa.government.bg/en>
[Higher Education Act](#) and [ECTS](#)

For in-service qualifications

[ORDINANCE No 15 of 22.07.2019 on the status and professional development of teachers, principals and other pedagogical specialists](#)

National regulations - for obtaining teachers qualification

The compulsory disciplines

1. Pedagogy - **60** hours ;
2. Main specialized course - competence approach and innovation in the education (**45** hours);
3. Psychology (**60** hours);
4. Methodology of training in (subject)...(**90** hours for 1 subject programmes/ **120** for double or more subjects;
5. Inclusive education (**30** hours);
6. Information and communication technologies in education and work in a digital environment. (**30** hours)

The mentioned hours are minimal

The elective disciplines

1. Group - pedagogical, psychological, educational management and specific didactic for the subject – universities should provide at least 6 courses from 12/14 defined in the ordinance. Students choose 2 of them.
2. Group - interdisciplinary and applied-experimental disciplines and disciplines in which training provides an upgrade of competences related to the specifics of the professional qualification

The practical training and state exams

1. Practical training
 - Observation of lessons in schools (hospitalization): **30** hours;
 - Current pedagogical practice: **60** hours – students conduct in school one or two lessons under supervision of the supervised teacher;
 - internship practice in school: **90** hours – under supervision of teacher supervisor, includes –. Teaching at least **15/22** new lessons/pedagogical situations).
2. State exams for obtaining teacher's qualification
 - state (practical-applied) exam – lesson in school in front of examination board

National regulations - for obtaining teachers qualification

List of required elective courses (Ministry of Education and Sciences – MES)

1. Interaction with family;
2. Pedagogical interaction in a multicultural environment;
3. Civic education;
4. Digital competence and digital creativity;
5. Development of lessons for training in an electronic environment;
6. Inclusive education for children and students with special educational needs;
7. Communication skills in an educational environment;
8. Relationship management in an educational environment;
9. Leadership in education;
10. Management of educational institutions;
11. Health and environmental education;
12. Other, but not more than three academic disciplines in the curriculum of specialty based on a decision of the Academic Council of the higher education institution.

National regulations – who can teach subjects in informatics

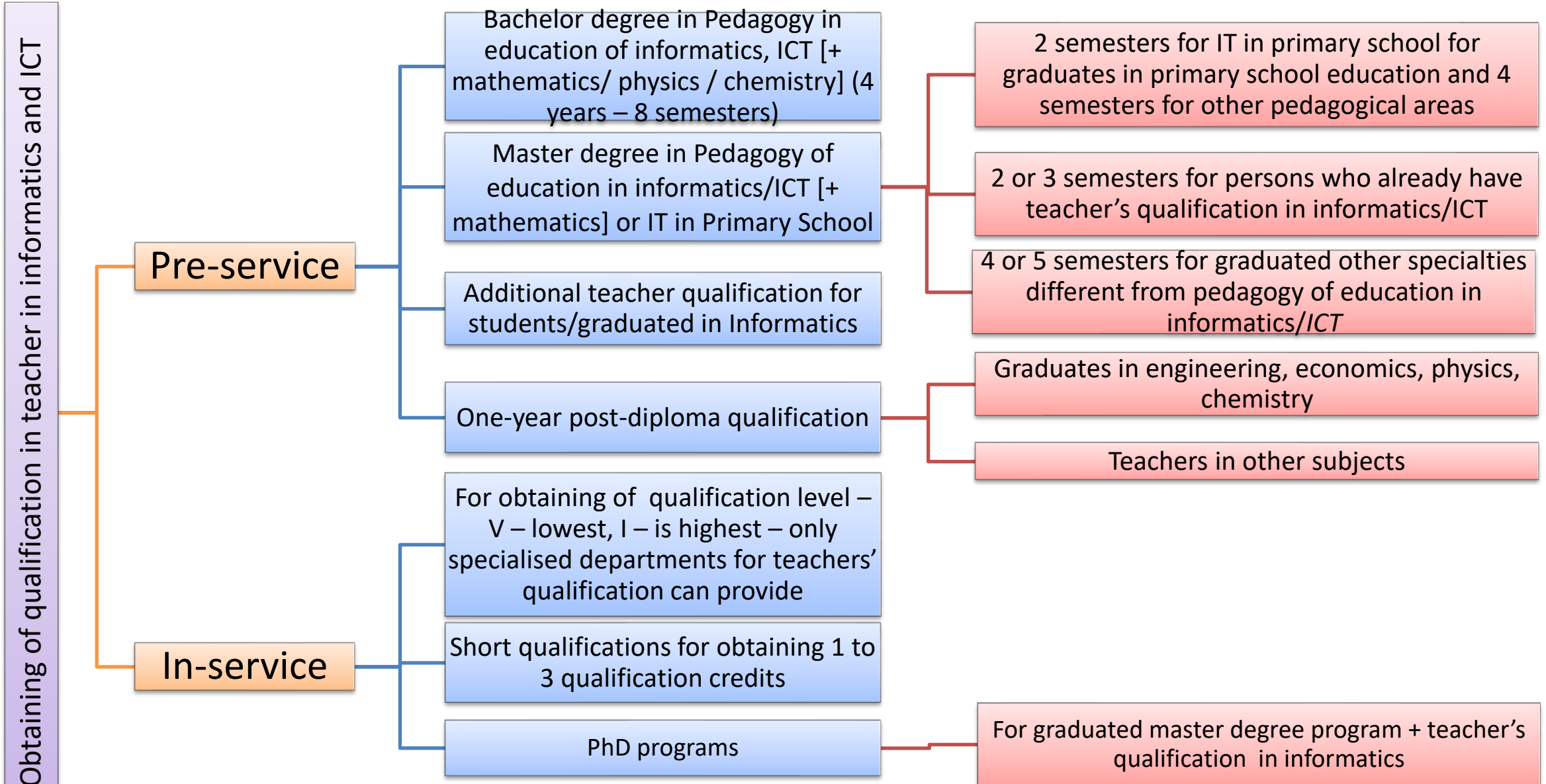
Computer modelling in primary school

- Primary school teachers:
 - with specialisations in IT in primary school
 - without specialisation (only with short term courses with 2(32 hours) or 3 (48 hours) credits)
- Teachers in computer modelling and IT, informatics

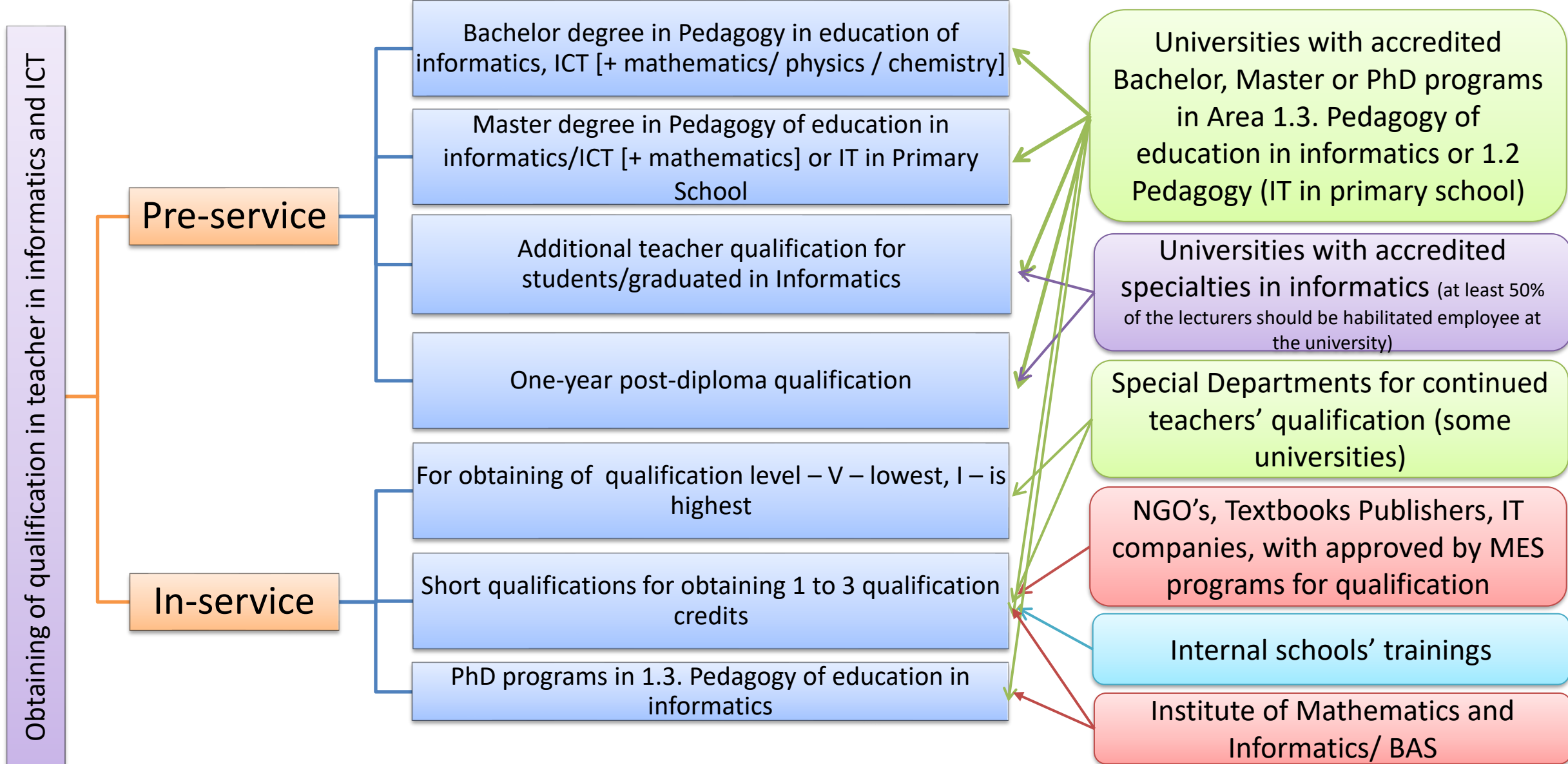
Computer modelling and IT, Informatics

- Specialties in which qualification exists education in informatics/IT (Math&Informatics; Physics&Informatics; Chemistry&Informatics)
- Informatics/Computer science with obtained teacher's qualification
- Teachers in other subjects with at least one-year post-diploma qualification "Teacher in informatics/IT"
- Mathematics, Engineering, Economics, Natural Sciences with at least one year post diploma-qualification "Teacher in informatics/IT"

Education of Teachers in Informatics and ICT – the Tracks



Education of Teachers in Informatics and ICT - Providers



Accredited university providers of bachelor/master/PhD degree programs for education of informatics teachers

- **Sofia University** “St. Kliment Ohridski”(SU) provides Double bachelor’s programmes –[Mathematics and Informatics](#); [Physics and Informatics](#) ; [Chemistry and informatics](#). Master degree programs: [Content aspects of the specialized training in Informatics](#), [E-Learning](#), [Technologies for Education in Mathematics and Informatics](#), [Educational technologies in specialized preparation in Information Technologies](#) (Joint program with South-West University Neofit Rilski, Shumen University “Bishop Konstantin Preslavki”, developed in the frame of the project MODERN@) [Innovation and multidisciplinary in teaching mathematics, computer modelling and Informatiton Technologies](#) (Joint program with South-West University Neofit Rilski, Trakia University Stara Zagora, and Burgas University Asen Zlatarov”, developed in the frame of the project MODERN@), PhD degree
- **South-west University** “Neofit Rilski”, Blagoevgrad (SWU), Double bachelor’s – [Pedagogy in education in mathematics, informatics and information technology](#) , Master’s degree programmes: [Information technologies in primary school education](#), [Technologies in mathematics and informatics education](#) , and two joint programmes with University of Sofia, mentioned above, PhD degree
- **University of Plovdiv** “St. Paisii Hilendarski” + PhD program, Bachelor’s – **Teacher in** [Information Technology](#), [Mathematics and Educational Management](#), [Mathematics, Informatics and Information Technology](#), Master degree: [Teaching Informatics and Information Technology in the Schools](#), [Teaching Informatics and Information Technology in the Schools](#), [Teaching Information Technology in the Primary Schools](#), [Teaching Information Technology in the Secondary Schools](#), PhD degree

Accredited university providers of bachelor/master/PhD degree programs for education of informatics teachers

- **University of Veliko Tarnovo** “St. St Cyril and Metodii” - bachelor’s – [Pedagogy in education in history and information technology](#), [Pedagogy in education in mathematics and informatics](#). Master programmes: [Information and communication technology in primary school](#), [Informatics and information technology](#), [Mathematics, Informatics and information Technology](#), [Technologies for education in mathematics and Informatics](#), PhD degree
- **University of Shumen** “Bishop Konstantin Preslavski” bachelor’s – [Mathematics and Informatics](#), [Information technology](#), [Informatics and Mathematics](#), Master’s programmes – [Pedagogy of education in informatics and information technology](#), [Pedagogy of education in mathematics and informatics](#), [Primary School Pedagogy and Information Technology](#), PhD degree
- **University of Ruse** bachelor’s – Branch Silistra [Pedagogy of education in Informatics and Physics](#), [Pedagogy of education in Mathematics and Informatics](#) , Master’s programmes – [Informatics and information technology in education](#), PhD degree
- **Trakia University (TrU)**, Stara Zagora – Single Bachelor’s – [Pedagogy of education technology education](#), Master’s degree programmes: [Information and communication technology in primary school](#), Joint programme with University of Sofia (US), mentioned above.
- **Technical University Sofia** (Triple bachelor’s programme– [Pedagogy of teaching in mathematics, physics and informatics](#) , Master’s degree programme [Pedagogy of teaching in mathematics, physics, and informatics](#).
- **University “prof. d-r Assen Zlatarov” – Burgas** – only joint master’s degree program with US, mentioned above.

Education of Teachers in Informatics at Soth-West University “Neofit Rilski”, Bulgaria

Bachelor

Pedagogy of education in
Mathematics, Informatics and ICT

Master

Technology of education in
mathematics and informatics – 1 year
(for specialists) and 2 year for others ;
IT in primary school (1 year for Primary
school and 2 years for other)
Two Joint master programs for
graduates with qualification “ Teacher
in informatics”

PhD / in schools it is equivalent to I
qualification degree/

Didactics of Mathematics and
Informatics;

Didactics of Informatics and ICT

Post-diploma qualification

for obtaining of qualification “Teacher
in informatics”.

Courses for obtaining pedagogical
qualification in Informatics and ICT
for students graduated in area of
Informatics

Short term qualification courses:

Multimedia in education;

Game based approach in teaching
informatics;

Design thinking skills

Education of Teachers in Informatics at Soth-West University “Neofit Rilski”, Bulgaria

- **Core courses in informatics for Bachelor degree – Teacher in informatics**
 - Introductory course in programming
 - Introduction in information systems and technologies
 - Object oriented programming
 - **Two school courses in informatics, IT and computer modelling (covers current content of school subjects)**
 - Computer networks and administration
 - Intellectual properties
 - Operation systems
 - Computer architectures
 - Database
 - Internet programming
 - Cyber security

- **Elective courses in area of informatics and didactics in informatics**
 - Algorithms and tasks in extracurricular work in informatics and IT
 - Web Systems and Technologies
 - Technology and data processing of a pedagogical experiment
 - Data processing and analysis with MSExcel and VBA
 - Web Content Management
 - Computer educational games in the teaching of mathematics and informatics
 - Interactive multimedia technologies
 - Theoretical foundations of informatics
 - Technologies for development and analysis of didactic tests

Education of Teachers in Informatics at South-West University “Neofit Rilski”, Bulgaria - **Joint master programs**



- With collaboration of University of Sofia, University of Shumen, University of Burgas and Trakia University of Stara Zagora
- Project Modern@ - BG05M2OP001-2.005-0001 - MODERNIZATION in partnership through digitization of the Academic Ecosystem", financed by the Operational Program "Science and Education for Smart Growth", co-financed by the European Union through the European Structural and Investment Funds.
- <https://e.modern-a.bg/>,
- accredited for Full time, Part time and Distance education study
 - Innovation and multidisciplinary in compulsory training in mathematics, computer modelling and IT (for teaching in 5th-7th grades)
 - Learning technologies in profiled IT training (for teachers in high school specializations - 11-12 grades)

Conclusions

- We have very dynamical content in the subjects in informatics field
- Crucial component in successful implementation of Informatics, IT and Computer modelling schools is teachers' qualification, experience, and competences
- We need to:
 - Provide appropriate methodological, teaching and learning resources for teachers and students.
 - Develop of appropriated didactical approaches for teaching informatics at all educational level
 - Be adaptive and responsive to dynamic changes of the school curricula in informatics area

Used resources

- Tuparov, G., Tuparova, D. (2023). The Ecosystem of Computer Science Education in Bulgarian Primary School – State of the Art. In: Zlateva, T., Tuparov, G. (eds) Computer Science and Education in Computer Science. CSECS 2023. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol 514. Springer, Cham.
https://doi.org/10.1007/978-3-031-44668-9_26
- Ordinance documents – links are given in relevant slides

Thank you for attention!

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