

APPROVED BY:

THE MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
National Research  
TOMSK STATE UNIVERSITY

Vice-Rector for Academic Affairs

V. V. Dyomin

Programme Curriculum

Field of study

02.03.02 Fundamental Computer Science and Information Technology

Specialization

Software engineering

Qualification of graduate

Bachelor

Duration of education

4 years

| №                                    | Name of Programme parts, modules, courses, practises | Workload   |                  | Workload distribution |           |           |           |           |           |           |           | Mode of stud | Form of midterm assessment | Learning outcomes                                       |  |
|--------------------------------------|--|------------|------------------|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|----------------------------|---|--|
|                                      |  | General    | Hours            | 1                     | 2         | 3         | 4         | 5         | 6         | 7         | 8         |              |                            |   |  |
|                                      |  | ETS        | Gen/face-to-face |                       |           |           |           |           |           |           |           |              |                            |   |  |
| <b>Part 1 Courses (modules)</b>      |  | <b>216</b> | <b>8104</b>      | <b>31</b>             | <b>29</b> | <b>30</b> | <b>30</b> | <b>27</b> | <b>27</b> | <b>30</b> | <b>12</b> |              |                            |   |  |
| <i>(201 – 216 ETS)</i>               |  |            | <b>3494</b>      |                       |           |           |           |           |           |           |           |              |                            |   |  |
| <b>Main part</b>                     |  | <b>120</b> | <b>4320</b>      | <b>27</b>             | <b>22</b> | <b>16</b> | <b>23</b> | <b>12</b> | <b>5</b>  | <b>9</b>  | <b>6</b>  |              |                            |   |  |
| <i>(99 – 120 ETS)</i>                |  |            | <b>1748</b>      |                       |           |           |           |           |           |           |           |              |                            |   |  |
| A.1.1                                | English language                                     | 12         | 432/192          | 2                     | 2         | 4         | 4         |           |           |           |           | S            | PF+m,PF+m,PF+m,E           | GC-5  |  |
| A.1.2                                | History  | 2          | 72/32            | 2                     |           |           |           |           |           |           |           | L,S          | PF+m                       | GC-2  |  |
| A.1.3                                | Philisophy   | 3          | 108/48           |                       |           | 3         |           |           |           |           |           | L,S          | PF+m                       | GC-1  |  |
| A.1.4                                | Law  | 4          | 144/48           |                       |           |           |           |           |           | 4         |           | S            | E                          | GC-4  |  |
| A.1.5                                | Intercultural Communication                          | 2          | 72/32            |                       | 2         |           |           |           |           |           |           | L            | PF                         | GC-3,GC-6   |  |
| A.1.6                                | Sport  | 2          | 72/36            | 1                     |           |           |           |           | 1         |           |           | L, PC        | PF,PF                      | GC-8  |  |
| A.1.7                                | Health and wellness                                  | 2          | 72/16            |                       |           |           |           |           |           |           | 2         | S            | PF                         | GC-9  |  |
| A.1.8                                | Information culture basics                           | 2          | 72/20            |                       |           |           |           | 2         |           |           |           | PC           | PF                         | GPC-4   |  |
| A.1.9                                | Economic Theory                                      | 4          | 144/64           |                       |           |           | 4         |           |           |           |           | L,S          | PF+m                       | GC-3,GC-4   |  |
| A.1.10                               | Calculus 1   | 6          | 216/94           | 6                     |           |           |           |           |           |           |           | L,PC         | E                          | GPC-1, PC-2   |  |
| A.1.11                               | Introduction to Higher Mathematics                   | 4          | 144/40           | 4                     |           |           |           |           |           |           |           | L,PC         | E                          | GPC-1, PC-2   |  |
| A.1.12                               | Linear Algebra 1                                     | 4          | 144/64           |                       | 4         |           |           |           |           |           |           | L,PC         | E                          | GPC-1, PC-2   |  |
| A.1.13                               | Differential and difference equations                | 4          | 144/48           |                       |           |           | 4         |           |           |           |           | L,LB         | PF+m                       | GPC-1, GPC-2, PC-2                                      |  |
| A.1.14                               | Calculating  | 5          | 180/64           |                       |           |           | 5         |           |           |           |           | L,LB         | E                          | GPC-1, GPC-2, PC-2, PC-3                                |  |
| A.1.15                               | Discrete probability                                 | 4          | 144/64           |                       | 4         |           |           |           |           |           |           | L,PC,LB      | E                          | GPC-1, GPC-2, PC-1, PC-2                                |  |
| A.1.16                               | Optimization methods and operations research 1       | 3          | 108/64           |                       |           |           |           | 3         |           |           |           | L,LB         | PF+m                       | GPC-1, GPC-2, PC-2, PC-6                                |  |
| A.1.17                               | Discrete math  | 3          | 108/48           | 3                     |           |           |           |           |           |           |           | L,PC         | PF+m                       | GPC-1, PC-2   |  |
| A.1.18                               | Computer Science                                     | 4          | 144/22           |                       |           |           |           |           |           |           | 4         | L            | E                          | GPC-1, GPC-2, GPC-3, PC-2, PC-7, PC-8                   |  |
| A.1.19                               | Systems analysis                                     | 3          | 108/32           |                       |           | 3         |           |           |           |           |           | L,PC         | PF+m                       | GC-6, GC-7, GPC-1, PC-4, PC-5, CPC-1                    |  |
| A.1.20                               | Introduction to programming                          | 19         | 684/336          | 9                     | 10        |           |           |           |           |           |           | L            | E, E                       | GPC-1, GPC-3, PC-3                                      |  |
| A.1.21                               | Data Bases   | 6          | 216/96           |                       |           | 6         |           |           |           |           |           | L,LB,PC      | E                          | GPC-2, GPC-3, PC-6                                      |  |
| A.1.22                               | Algorithms and complexity analysis                   | 6          | 216/96           |                       |           |           | 6         |           |           |           |           | L,LB,PC      | E                          | GPC-1, GPC-2, GPC-3, PC-2, PC-3                         |  |
| A.1.23                               | The theory of automata and formal languages          | 4          | 144/48           |                       |           |           |           | 4         |           |           |           | L,LB         | E                          | GC-6, GPC-1, GPC-2, GPC-3, PC-2, PC-3, PC-4             |  |
| A.1.24                               | Operating systems                                    | 3          | 108/48           |                       |           |           |           | 3         |           |           |           | L,PC         | E                          | GPC-2, PC-7, PC-8                                       |  |
| A.1.25                               | Computer networks                                    | 4          | 144/48           |                       |           |           |           |           | 4         |           |           | L,PC         | E                          | GPC-2, PC-7, PC-8                                       |  |
| A.1.26                               | Software Engineering                                 | 5          | 180/48           |                       |           |           |           |           |           | 5         |           | L,LB         | E                          | GC-6, GC-7, GPC-2, GPC-3, PC-2, PC-3, PC-4, PC-7, CPC-1 |  |
| <b>Variational part (96–102 ETS)</b> |  | <b>96</b>  | <b>3784</b>      | <b>4</b>              | <b>7</b>  | <b>14</b> | <b>7</b>  | <b>15</b> | <b>22</b> | <b>21</b> | <b>6</b>  |              |                            |   |  |
| <i>courses by choice included</i>    |  |            | <b>1746</b>      |                       |           |           |           |           |           |           |           |              |                            |   |  |
| B.1.1                                | English language (вариативная часть)                 | 7          | 252/128          |                       |           |           |           | 3         | 4         |           |           | S            | PF+m,E                     | GC-5  |  |
| B.1.2                                | Publuc speaking                                      | 2          | 72/16            |                       | 2         |           |           |           |           |           |           | S            | PF                         | GC-5  |  |
| B.1.3                                | Calculus 3   | 6          | 216/94           |                       |           | 6         |           |           |           |           |           | L,PC         | E                          | GPC-1, PC-2   |  |
| B.1.4                                | Linear Algebra 2                                     | 4          | 144/64           |                       |           | 4         |           |           |           |           |           | L,PC         | E                          | GPC-1, PC-2   |  |
| B.1.5                                | Graph theory   | 3          | 108/64           |                       | 3         |           |           |           |           |           |           | L,PC         | PF+m                       | GPC-1, PC-2   |  |
| B.1.6                                | Simulation modeling                                  | 3          | 108/64           |                       |           |           |           |           | 3         |           |           | L,LB         | PF+m                       | GPC-1, GPC-3, PC-2, PC-3                                |  |
| B.1.7                                | Physical basis of the computer                       | 2          | 72/16            |                       |           |           |           |           | 2         |           |           | L            | PF+m                       | GPC-1   |  |
| B.1.8                                | Introduction to Computer Science                     | 2          | 72/32            | 2                     |           |           |           |           |           |           |           | L            | PF                         | GPC-1   |  |
| B.1.9                                | OOP - object oriented programming                    | 4          | 144/48           |                       |           | 4         |           |           |           |           |           | L,LB         | PF+m                       | GPC-1, GPC-2, GPC-3, PC-2, PC-3                         |  |
| B.1.10                               | System Programming 1                                 | 2          | 72/32            |                       |           |           | 2         |           |           |           |           | LB           | PF+m                       | GPC-3, PC-7   |  |
| B.1.11                               | System Programming 2                                 | 2          | 72/32            |                       |           |           |           | 2         |           |           |           | L,LB         | PF+m                       | GPC-2, GPC-3, PC-3                                      |  |
| B.1.12                               | Structural design                                    | 3          | 108/56           |                       |           |           | 3         |           |           |           |           | L,LB         | PF+m                       | GPC-2, GPC-3, PC-7                                      |  |
| B.1.13                               | Architecture of computing systems                    | 2          | 72/24            |                       |           |           | 2         |           |           |           |           | L            | PF+m                       | GPC-2, PC-7, PC-8                                       |  |
| B.1.14                               | Information Security                                 | 3          | 108/32           |                       |           |           |           |           |           |           | 3         | L,PC         | PF+m                       | GPC-4, PC-2, PC-5, PC-8                                 |  |

|                                      |  |            |                  |           |           |           |           |           |           |           |           |       |                        |   |
|--------------------------------------|--|------------|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|------------------------|---|
| B.1.15                               | Web technologies                               | 6          | 216/80           |           |           |           |           | 3         | 3         |           |           | L, LB | PF+m, PF+m             | GPC-2, GPC-3, PC-3, PC-7  |
| B.1.16                               | Computer graphics                              | 6          | 216/64           |           |           |           |           |           |           | 6         |           | L, LB | E                      | GPC-1, GPC-2, GPC-3, PC-2, PC-3   |
| B.1.17                               | Russian Language                               | 4          | 144/64           | 2         | 2         |           |           |           |           |           |           | S     | PF, PF                 | GC-5  |
| B.1.18                               | Parallel computing                             | 2          | 72/32            |           |           |           |           |           | 2         |           |           | L, LB | PF+m                   | GPC-1, GPC-2, GPC-3   |
| B.1.19                               | Artificial intelligence                        | 4          | 144/64           |           |           |           |           |           |           | 4         |           | L, LB | PF+m                   | GPC-1, GPC-2, GPC-3   |
| B.1.20                               | Sport elective                                 | 0          | 328              | 0         | 0         | 0         | 0         | 0         | 0         |           |           |       | PF, PF, PF, PF, PF, PF | GC-8  |
| <b>Courses by choice</b>             |  | <b>29</b>  | <b>1044/412</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>7</b>  | <b>8</b>  | <b>8</b>  | <b>6</b>  |       |                        |   |
| B.1.21                               | Optimization methods and operations research 2 | 4          | 144/64           |           |           |           |           |           | 4         |           |           | L, LB | E                      | GPC-1, PC-2   |
| B.1.22                               | Decision making methods                        |            |                  |           |           |           |           |           |           |           |           |       |                        | GPC-1, PC-2   |
| B.1.23                               | UNIX   | 5          | 180/96           |           |           |           |           |           |           | 5         |           | L, LB | PF+m                   | GPC-2, PC-3   |
| B.1.24                               | System administration                          |            |                  |           |           |           |           |           |           |           |           |       |                        | GPC-2, PC-8   |
| B.1.25                               | OOA&D - Object oriented design and analysis    | 8          | 288/128          |           |           |           |           | 4         | 4         |           |           | L, LB | PF+m, E                | GPC-2, PC-7, PC-8   |
| B.1.26                               | Software design                                |            |                  |           |           |           |           |           |           |           |           |       |                        | GPC-2, PC-7, PC-8   |
| B.1.27                               | Programming languages                          | 3          | 108/32           |           |           |           |           | 3         |           |           |           | L, LB | E                      | GPC-2, PC-8   |
| B.1.28                               | Software Requirements                          |            |                  |           |           |           |           |           |           |           |           |       |                        | GPC-2, PC-7   |
| B.1.29                               | Corporate information systems                  | 3          | 108/48           |           |           |           |           |           |           | 3         |           | L, LB | PF+m                   | GC-3, GPC-2, GPC-3, PC-3  |
| B.1.30                               | Economic information systems                   |            |                  |           |           |           |           |           |           |           |           |       |                        | GC-3, GPC-2, GPC-3, PC-3  |
| B.1.31                               | Development on UNIX                            | 6          | 216/44           |           |           |           |           |           |           |           | 6         | L, LB | E                      | GPC-2, GPC-3, PC-3  |
| B.1.32                               | iOS Development                                |            |                  |           |           |           |           |           |           |           |           |       |                        | GPC-2, GPC-3, PC-3  |
| <b>Part 2. Practises (15-33 ETS)</b> |  | <b>18</b>  | <b>648/86</b>    | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>3</b>  | <b>3</b>  | <b>0</b>  | <b>12</b> |       |                        |   |
| B.2.1                                | <b>Educational practice</b>                    | <b>3</b>   | <b>108/32</b>    |           |           |           |           | <b>3</b>  |           |           |           |       |                        |   |
| B.2.1.1                              | Teaching and research practice                 | 3          | 108/32           |           |           |           |           | 3         |           |           |           | S     | PF                     | GC-7, GPC-1, PC-1, PC-3, PC-4, PC-5, CPC-1                                |
| B.2.2                                | <b>On-the-job practice</b>                     | <b>15</b>  | <b>540/54</b>    |           |           |           |           |           | <b>3</b>  | <b>12</b> |           |       |                        |   |
| B.2.2.1                              | Research work                                  | 3          | 108/32           |           |           |           |           |           | 3         |           |           | S     | E                      | GC-7, GPC-2, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-8, CPC-1       |
| B.2.3.2                              | Predegree practice                             | 12         | 432/22           |           |           |           |           |           |           |           | 12        | S     | PF+m                   | GC-7, GPC-2, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, CPC-1 |
| <b>Part 3. Final exam (6-9 ETS)</b>  |  | <b>6</b>   | <b>216</b>       | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>0</b>  | <b>6</b>  |       |                        |   |
| A.3.1                                | Bachelor Thesis                                | 6          | 216              |           |           |           |           |           |           |           | 6         |       | Mark                   | GC-7, GPC-2, GPC-4, PC-1, PC-2, PC-3, PC-4, PC-5, PC-6, PC-7, PC-8, CPC-1 |
| <b>Total</b>                         |  | <b>240</b> | <b>8968/3580</b> | <b>31</b> | <b>29</b> | <b>30</b> | <b>30</b> | <b>30</b> | <b>30</b> | <b>30</b> | <b>30</b> |       |                        |   |
| <b>Electives</b>                     |  | <b>6</b>   | <b>216/192</b>   | <b>0</b>  | <b>0</b>  | <b>1</b>  | <b>1</b>  | <b>1</b>  | <b>1</b>  | <b>1</b>  | <b>1</b>  |       |                        |   |
| FTD.1                                | English language (leveling course)             | 6          | 216/192          |           |           | 1         | 1         | 1         | 1         | 1         | 1         | PC    | PF, PF, PF, PF, PF, PF | GC-5  |
| <b>Total</b>                         |  | <b>246</b> | <b>9184/3772</b> | <b>31</b> | <b>29</b> | <b>31</b> | <b>31</b> | <b>31</b> | <b>31</b> | <b>31</b> | <b>31</b> |       |                        |   |

Conventions

L Lectures  
S Seminar  
L, B Laboratory classes  
PC Practical classes

PF Pass-Fail  
PF+m Pass-Fail with marks  
E Exam