#### card of course

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| Subject name | Frontend Technologies |

1. The placement of the subject in the study system

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| 1.1. Field of study | Computer science |
| 1.2. Form and path of study | Full-time/Part-time |
| 1.3. Level of education | First-cycle studies |
| 1.4. Study profile | Practical |

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| 1. 5. Specialty | Web Technologies and the Internet of Things |
| 1.6. Subject Coordinator | Dr inż. Tomasz Szymczyk |

2. General characteristics of the subject

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| 2.1. Belonging to a subject group | Optional/Practical |
| 2.2. Number of ECTS | 6 |
| 2.3. Language of lectures | English |
| 2.4. Semesters in which the subject is taught | V |
| 2.5.Criteria for selecting course participants | For the specialization: Web Technologies and Internet of Things |

1. Learning outcomes and course delivery
   1. Subject Objectives

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| No. | Subject Objectives |
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| C1 | To familiarize students with the issues of creating web applications in the context of usability  and security, currently applicable on the Internet. |
| C2 | To equip students with the skills to create advanced Internet applications using modern technologies and tools. |
| C3 | To familiarize students with advanced issues of creating web applications using current internet design and programming standards. |

* 1. Subject-specific learning outcomes, divided into knowledge , skills and competences , with reference to the directional learning outcomes

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| No. | Description of subject  learning outcomes | Reference to  directional effects  learning (symbols) | Method of implementation (mark "X") | | | |
| ST | | NST | |
| Classes at the University | Activities on  the platform | Classes at the University | Activities on  the platform |
| After passing the course, the student knows and understands **the knowledge** | | | | | | |
| W1 | Knows about the existence of both application programming correctness (WCAG) as well as non-technical correctness in terms of accessibility (WCAG) and UX. | INF\_W20  INF\_W21 |  | X |  | X |
| W2 | Knows how to combine HTML5 with JavaScript in an advanced way in the Document Object Model (DOM). |  | X |  | X |
| W3 | Knows how to create SPA applications, knows how to use the Bootstrap framework. |  | X |  | X |
| W4 | Knows how advanced HTML5 API elements work. |  | X |  | X |
| After passing the course, the student is **able** to: | | | | | | |
| U1 | Create a front end design in accordance with WCAG and broadly understood interface ergonomics. | INF\_U19 INF\_U20 INF\_U23 | X |  | X |  |
| U2 | Create responsive front end versions. | X |  | X |  |
| U3 | Create a simple interactive game. | X |  | X |  |
| After completing the course, the student is ready to take part in **social competences.** | | | | | | |
| K1 | The student is able to effectively determine the priority of a given task before starting its implementation. | INF\_K04 | X |  | X |  |

3.3. Forms of teaching and their number of hours - Full-time studies (ST), Part-time studies (NST)

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| Path | Lecture | Exercises | Design | Workshop | Laboratory | Seminar | Lecturer | Classes conducted using distance learning methods and techniques in the form of a lecture | Other | **ECTS points** |
| **ST** |  |  |  |  | 40 |  |  | 20 |  | 6 |
| **NST** |  |  |  |  | 20 |  |  | 10 |  | 6 |

3.4. Content of education (separately for each form of classes: (W, ĆW, PROJ, WAR, LAB, LEK, OTHER). It should be marked (X) how the given content will be implemented (classes at the university or classes on the e-learning platform conducted using distance learning methods and techniques)

TYPE OF CLASS: LECTURE

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| No. | Content of the course | Reference to subject- specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | WCAG. Designing the user interface of a web application based on W3C standards. | W1 |  | X |  | X |
| 2. | HTML forms as the basis for interaction with the user of a web application. Security of the web application and the importance of validating data sent from an HTML form. Methods of validating data in the form - types of fields and attributes of HTML5. Application of regular expressions in data validation. Creating responsive pages. | W2 |  | X |  | X |
| 3. | Document Object Model (DOM). Event handling. Accessing client-side form fields using JavaScript. Regular expression support in JavaScript.  Creating SPA applications, analyzing programming (code) of a simple game. | W2, W3 |  | X |  | X |
| 4. | HTML5 API elements – geolocation mechanism, local network storage (Local Storage, Session Storage). Working with data in JSON format. Basics of object-oriented programming in JavaScript. | W4 |  | X |  | X |
| 5. | Summary of classes and discussion of grades |  |  | X |  | X |

TYPE OF CLASS: LABORATORY

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| No. | Content of the course | Reference to subject-specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | WCAG requirements for websites. The role of design in the process of creating applications design.  Validating HTML code using the W3C validator. Creating a graphical user interface based on basic HTML form elements. | U1 | X |  | X |  |
| 2. | Building a simple SPA application using JavaScript functions. | U2 | X |  | X |  |
| 3. | Client-side form handling and validation using JavaScript and HTML5. | U2, K1 | X |  | X |  |
| 4 | Creating a simple browser game using JavaScript and the jQuery library | U3, K1 | X |  | X |  |
| 5 | Creating a responsive website template using the Bootstrap framework. jQuery, lightbox | U2 | X |  | X |  |
| 6. | Building an application using geolocation and local data storage. | U2 | X |  | X |  |
| 7. | Summary of classes and discussion of grades |  | X |  | X |  |

3.5. Methods of verifying learning outcomes (indication and description of methods of conducting classes and verification of achievement of learning outcomes and method of documentation)

Verification methods:

Lecture credits: Exam: Test containing a set of 20 questions. Scoring:

Score 3: 11 – 12 points

Rating 3.5: 13 – 14 points

Score 4: 15 – 16 points

Rating 4.5: 17 – 18 points

Score 5: 19 – 20 points

Laboratory:

1. Individual laboratory work – 50% of final grade.
2. Project work. The student has a choice of several themes of the work, associated with a specific color scheme. The student is to design low-fidelity mockups presenting the graphic layout of the work. The software of the WWW portal is to be done in the SPA technique (Single Page Application). This requires the use of an advanced combination of Java Script with HTML 5 (Document Object Model model). The student is to add an HTML 5 API element: local and session storage, geolocation elements. The assessment includes: the use of all groups of elements, as well as general ingenuity in using individual elements. The work is not assessed in terms of aesthetic values. The student, knowing the issues of application accessibility (WCAG guidelines) and code validation (W3C), creates a completely correct thematic website. Referring to the quality of the software, the student is to enter extensive comments to each part of the project (html, css, java script). The student is also to demonstrate in the field of size optimization (number of lines) and "code purity" (correct coding). - 50% of the final grade.

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| Subject Effects | Teaching methods | Methods of verifying learning outcomes | Documentation methods |
| KNOWLEDGE | | | |
| W1-W4 | Exam/Test (platform) | Exam | Examination sheet |
| SKILLS | | | |
| U1-U3 | Laboratory work, work on an individual project, according to strictly defined parameters, topic, rules and technology | 1. Individual laboratory work 2. Design work | Files posted on the platform |
| SOCIAL COMPETENCES | | | |
| K1 | Laboratory work, work on an individual project, according to strictly defined parameters, topic, rules and technology | 1. Individual laboratory work 2. Design work | Files posted on the platform |

3.6. Assessment criteria for the achieved learning outcomes

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| Learning effect | For a grade of 3 or "pass."  the student knows and understands /is able to/is ready to | For a grade of 3.5, the student knows and understands/is able to/is ready to | For a grade of 4, the student knows and understands/is able to/is ready to | For a grade of 4,5, the student knows and understands/is able to/ is ready to | For a grade of 5, the student knows and understands/is able to/is ready to |
| W | 51-60% of knowledge indicated in learning outcomes | 61-70% of knowledge indicated in learning outcomes | 71-80% of knowledge indicated in learning outcomes | 81-90% of knowledge indicated in learning outcomes | 91-100% of knowledge indicated in learning outcomes |
| U | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |
| K | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |

3.7. Literature

**Basic**

1. Gajda,Włodzimierz.HTML5 i CSS3 : praktyczne projekty Gliwice : Helion, 2013
2. http://www.w3schools.com
3. https://www.gov.pl/web/dostepnosc-cyfrowa/wcag-21-w-skrocie

**Supplementary**

1. Frahaan Hussain, Responsive Web Design. Nowoczesne strony WWW na przykładach,   
   Helion 2019
2. https://startbootstrap.com/

4. Student workload - ECTS points balance

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| **Types of student activity** | **Student Load** | |
| **ST** | **NST** |
| **Classes requiring direct contact between the student and the academic teacher at the university premises** | **60** | **30** |
| Classes included in the study plan | 60 | 30 |
| **Student's own work** | **90** | **120** |
| Ongoing preparation for classes, preparation of project work/presentations/etc. | 45 | 60 |
| Preparation for passing classes | 45 | 60 |
| **TOTAL STUDENT HOURLY LOAD** | **150** | **150** |
| **Number of ECTS points** | **6** | **6** |

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| Last change date | 30/09/2024 |
| The changes were introduced | INF Education Quality Team |
| The changes were approved | Arkadiusz Gwarda, M.A. |