BASICS OF WEB DESIGN

- Internet, World Wide Web, Web page, site
- How does the network organized? Principles of operation of client-server technologies. Basic concepts: Domain name, IP address, DNS, Internet service provider, server, URL
- HTTP, HTTPS, SSH and FTP protocols
- The concept of Web site. Types of cites
- Mail and messengers
- Search system operation

HTML5/CSS3

Subject aim: Teaching the students to execute the layout of sites by means of block layout. Upon completion of the course, students will be able to execute the layout of sites of varying complexity and find solutions in case of difficulties

INTRODUCTION. HTML STRUCTURE

- Introduction to the subject
- Introduction to markup languages. Hypertext markup languages (HTML)
- HTML tags
- Basic structure of HTML document. Basic elements and their purpose
- Page encoding and <meta> tags:

TEXT FORMATTING BY MEANS OF HTML

- Classification of tags: inline and block
- Text formatting model: headings and paragraphs
- Classification of tags: high-level and low-level formatting
- Colors in Web

FORMATTING PERFORMED USING CSS

- Cascading Style Sheets (CSS)
- Tags containing no formatting: is a block tag; - an inline tag
- Analogy of HTML and CSS by the example of inline and block tags:
- The use of class and id attributes for the style specification
- The use of external CSS style files
- Practice: Text formatting using CSS

LISTS. CSS INDENTS AND FIELDS

- Creating the lists
- Creating the nested lists
- Formatting the lists using CSS
- Definition lists: <dl>, <dd> and <dt> elements
- Controlling the indents and fields

GRAPHICS IN WEB DESIGN. OPTIMIZATION OF GRAPHICS

- Graphics file formats in Web
- The <img /> tag and its attributes (src, alt, width, height, border)

HYPERLINKS. PRINCIPLES OF WEB SITE NAVIGATION

- General information about hyperlinks
- Absolute and based-indexed addressing
- Creating a horizontal and vertical menu, formatting. The display property. Converting the link into a block element. Differences between block, inline and inline-block
- Pseudo classes
- Pseudo elements: before and after
- The cursor CSS property
- Practice: working on the development of image gallery and popup menu

TABLES

- Creating the basic table. <table>, <tr> and <td> tags
- Joining the cells: colspan and rowspan attributes
- Tags of logical table structuring: <thead>, <tbody>, <tfoot>. Tags of logical column grouping: <colgroup>, <col>
- Table border control: frame and rules attributes
- The table-layout property
- Creating a table using CSS: display: table, table-row, table-cell
- Practice: creating the complex tables

EXECUTING THE LAYOUT OF WEB PAGES BY MEANS OF TABLES

- Basics of table layout. Table layout application: its pros and cons. This subject is important as the layout of modern casting mails is executed using the tables only
- Practice

EXECUTING THE LAYOUT OF WEB PAGES BY MEANS OF BLOCKS

BASICS OF BLOCK LAYOUT. RULES OF EXECUTING THE LAYOUT

- Considering the simplest structures of the pages and elements
- Visibility and overflow properties
- Practice

FORMS. POSITIONING

- Forms. Basic terms
- The position property

EXECUTING THE LAYOUT OF WEB PAGES BY MEANS OF BLOCKS USING THE POSITIONING

DEVELOPMENT OF PAGES BY MEANS OF HTML5 AND CSS3

- Structure of HTML5 document
- HTML5 is a competitor of Flash (overview)
- New elements of forms. Placeholders
- New features: CSS3
- Consideration of new APIs in order to manage the data within the page

DEVELOPMENT OF ADAPTIVE LAYOUT

- The use of @media for adaptive layout. Examples of implementation
- The use of viewport for correct site displaying in the mobile devices
- Practice

BASICS OF WEB DESIGN

Subject aim: Teaching the students to operate the PSD layout of varying complexity: revise the existing layouts, perform layout of pages using Photoshop. It should be noted that the subject does not provide students with the principles of development of Web pages in Photoshop (does not teach to create design), but shows basic thinking of the designer and features of Adobe Photoshop (teaches to perform correct conversion of psd to html)

DESIGN AND DEVELOPMENT OF WEB SITES

- Developing the sites from scratch. Stages of site development: communication with the customer, creation of the requirements document, design prototyping, creation of design, layout of design, programming, content, seo optimization and promotion
- The importance of each of the stages and sequence of their implementation
- Challenges arising at every stage
- Examples of the requirements documents

INTRODUCTION TO PHOTOSHOP. SELECTION AND FILL

- Raster and vector images
- Opening and creating new documents
- Photoshop tools palette. Proximity tools and the Hand tool
- Selection tools
- Color selection. Palette of colors. The Eyedropper tool
- Fills and gradients
- Image saving. Image formats for Web. Web optimization of image

OPERATING THE LAYERS. THE BRUSH TOOL. WORKING WITH TEXT

- The Layers palette. Creation, removal and duplication of layers, aliasing, transparency
- Rulers and guidelines. Grid
- The Brush tool
- Working with text. Adjustment of pixel values. Adjustment of interline spacing and indents
- The Move tool

TRANSFORMATION. EFFECTS OF LAYERS. MASKS

- Selection tools
- Transform selection
- Effects of layers. Duplicating and removing the effects
- Quick mask. Layer mask. Clipping mask
- Working with vector tools. Rasterizing the vector layers

SELF-DETERMINED TASK FOR AN EXAM

- Executing the site layout using Photoshop

BASICS OF USABILITY

- Basic concepts: learning capability, effectiveness, memorability, errors, contentment
- Major site problems: a user looks through the site in a quick manner; a user randomly navigates through the pages; users have many questions; poor organization of data; no visual hierarchy
- Comparing the usability of virtual and real shops
- Traditions, customs and conventions

SEO

BASICS OF OPTIMIZATION. INTERNAL OPTIMIZATION

- Introduction. Methods of search engine optimization: white, gray, black
- Basic concepts: types of Web resources, target audience
- Structure and organization of indexes in search systems
- Basics of internal search engine optimization
- Enhancing the site structure
- Peculiarities of site indexation
- Site optimization tools
- A task for the site analysis

EXTERNAL OPTIMIZATION. SITE ANALYSIS

- Site promotion, basic steps: registration of sites by means of indexing services, registration of sites in catalogues, purchasing the links, context
- White and black catalogues. Peculiarities and tricks of operation
- Managing the behavioral factors as a rating factor
- Search engine advertising
- Site promotion in social networks
- Mailout, the use of proprietary base of mails
- Installation of counters of Google and Yandex on the sites
- Stages of creating a marketing site, CMS selection

JAVASCRIPT

The program is divided in two parts: basics of EcmaScript programming and client JavaScript. The first part of program is aimed to provide students with understanding of programming; the second one is targeted to solving the major JavaScript problems

BASICS OF PROGRAMMING. ECMASCRIPT

Subject aim: teaching the students to create algorithms and solve problems on the EcmaScript programming. Upon completion of the course, students will be able to solve standard programming problems by means of conditions, cycles, nested loops, arrays and functions

INTRODUCTION TO PROGRAMMING. BASIC CONCEPTS OF ECMASCRIPT. VARIABLES. OPERATORS

- Basic Concepts. Genesis of EcmaScript. What is JavaScript? What is the purpose of JavaScript
- EcmaScript syntax
- JavaScript incorporation into HTML code
- Comments
- Variables
- Operators
- Arithmetical operators
- String operators
- Bitwise operators
- Logical operators
- Comparison operators
- Increment and decrement operators
- Assignment operators. Contracted forms of assignment operators
- The Conditional operator (ternary)
- Precedence of operators. Sequence of execution of the operators
- Conversion of data types
- Auxiliary functions: parseInt, parseFloat, isNaN, isFinite

THE IF...ELSE CONDITIONAL OPERATOR. NESTED CONDITIONAL. THE SWITCH SELECTIVE OPERATOR

- The concept of control flow chart
- The if...else operator
- Nested conditional
- Examples of complex tasks using the conditional operator
- The switch selective operator

THE DO...WHILE, WHILE, FOR CYCLES. NESTED LOOPS

- Cycles
- Nested loops

ARRAYS AS A TYPE OF DATA STORAGE

- Arrays
- Standard problems on arrays: sum, search and others
- Arrays sorting algorithm
- The concept of two-dimensional and multi-dimensional arrays

FUNCTIONS

- Functions
- Function arguments
- Return values
- Function as a variable. Anonymous functions
- Recursion

OBJECTS

- Objects
- Constructors of objects
- Arrays and strings as objects
- Prototypes
- Closures in EcmaScript. Scope of methods allocated on the heap. Hiding the code in the wrapping function. The with operator used for enlarging the scope of object

DATA AND TIME. MATHEMATICAL FUNCTIONS. REGULAR EXPRESSIONS. EXCEPTION HANDLING

- Date and time
- Mathematical functions
- Regular expressions
- Exceptions

CLIENT JAVASCRIPT

Subject aim: Teaching the students to operate with HTML document by means of JavaScript

Compulsory tools: Site: http://javascript.ru/, Web inspector

INTRODUCTION TO CLIENT JAVASCRIPT. STRUCTURE OF THE DOM DOCUMENT

- Compliance in client JavaScript. Cross-browser
- DOM — the document structure
- Global elements in the DOM tree
- Searching the elements in the DOM tree
- Document navigation
- Node manipulation: creation, removal and movement

EVENTS IN JAVASCRIPT. EVENT HANDLERS

- Encoding in the address line through "javascript:"
- Events in JavaScript
- Setting the event
- Mouse and keyboard events
- Form events
- Load events
- Brief overview of the Event object
- Bubbling events
- Standard events

THE WINDOW GLOBAL OBJECT. COOKIE

- The window object
- alert, confirm, prompt methods
- setInterval, setTimeout, clearInterval, clearTimeout methods
- The Location object
- The History object
- The Navigator object
- The Cookie operation

EXAM

- Test on JavaScript
- Complex problem on client JavaScript

SUMMATIVE COURSE PAPER ON FRONT-END

JQUERY

INTRODUCTION. SEARCH BY SELECTORS, FILTERING AND BYPASSING THE ELEMENTS

- Introduction and general information
- Selectors
- Filtering and bypassing the elements

EVENTS. EFFECTS AND ANIMATION

- Events
- Effects and animation:

ATTRIBUTES AND CSS. MANIPULATING THE ELEMENTS AND THE DOM TREE

- Attributes and CSS. Dimensions and classes
- Manipulating the elements
- Tasks on DOM: filtering the table cells, search by words within the table, forwarding form validation, editable table rows, assorting the table rows, subtabs of text areas within the page, click through by means of pressing the block

AJAX

- AJAX operation
- Tasks: pop-ups downloaded from files; creation of table, downloaded from the json file

PLUG-INS

- Plug-ins for jQuery:
- Creating a personal plug-in
- Kernel functions

EXAM

- Creating a personal plug-in

INTRODUCTION TO UNIX

Subject aim: Show major features of systems similar to Unix, teach the students to work with a console in order to perform simple operations for adjusting and/or working with site (hosting) under control of the systems similar to Unix

INTRODUCTION. GENESIS. BASIC UNIX FILES AND FOLDS

- Introduction
- Genesis, versions and major characteristics of OC UNIX
- Users and groups
- Files and catalogues

FILE AND LOGICAL SYSTEMS. PROCESSES

- Structure and features of file systems
- File system control
- Process management

WORKING WITH TEXT FILES. COMMAND INTERPRETER

- Text processing means
- Command interpreter

USEFUL UTILITIES

- Basic utilities

PHP

SERVER INSTALLATION AND SETTING. BASIC PROGRAMMING STRUCTURES

- Introduction to PHP. Differences between client and server-side Web programming. Scope of application. Informational recourses, documentation. The concepts of "client" and "server"
- Apache Web server installing and setting for Windows
- PHP syntax. PHP and HTML. Direct and reverse embedding
- Data output. Debugging output
- Levels of PHP errors:
- Installation of error_reporting directive for php.ini file
- Comments in PHP scripts (/* */, //, #)
- Variables in PHP
- Constants in PHP
- Operators in PHP
- Control PHP programming structures

STRINGS, ARRAYS AND FUNCTIONS

- Dates
- Strings in PHP
- Arrays in PHP. Features of array structure
- User defined functions in PHP
- Maintenance of regular expressions in PHP
- Development of function libraries

CGI AND HTTP INTERFACE. FORM OPERATION

- "Client-server" architecture. CGI principles and HTTP protocol. Review of queries and responses in browser inspector
- Statuses of HTTP responses
- HTTP headings
- The $_SERVER super global array. Environment variables.
- The query parameter processing. $_GET, $_POST, $_COOKIE and $_REQUEST super global arrays
- Elements of HTML forms. GET and POST transmission methods. Data transmission into other scripts (action)
- A form and its handler in one script

FILE SYSTEM

- Working with files by means of PHP
- Functions for the directory handling
- File download through the form. The $_FILES super global array. Multiple boot
- Database organization in files

USER DATA STORAGE

- The mechanism of COOKIE
- The mechanism of sessions
- A task on session operation: authorization and development of access counter

INTRODUCTION TO OBJECT ORIENTED PHP PROGRAMMING

- PHP classes
- $this pseudo-variable is available if the method was called in the object context. The self pseudo-constant
- Static properties and methods
- Declaration of constants in the classes using the 'const' keyword
- Constructors and destructors
- A task to develop a class in order to work with text files

PHP INHERITANCE AND ENCAPSULATION

- Inheritance
- Encapsulation
- Overriding classes prevention — final classes
- Abstract classes and methods
- The instanceof class rating
- Interfaces of interface and implements objects
- Magic methods
- Object cloning
- Functions for the class operation
- Errors and exceptions
- The use of classes in practice

DESIGN PATTERNS. SINGLETONE, MVC

- The concept of design pattern. Basic principles
- Singletone
- MVC
- Practical development of the site using MVC

ADDITIONAL FUNCTIONS

- Working with XML
- Functions for the JSON operation
- Maul features of PHP. The mailto() function
- Working with HTTP
- Output buffering

EXAM

- A task to develop a site, parcer or game

DATABASE THEORY. MYSQL

THE CONCEPT OF DATABASE

- The concept of database: database, database management system, SQL, MySQL DBMS
- Types of associations: one-to one, one-to-many, many-to-many
- Database structures: hierarchical structure of databases, network database structure, relational database structure, object oriented and hybrid databases
- Principles of relational database
- Types of keys: primary key (PK), foreign key (FK)
- Examples of use (show how the associations are drawn):
- Conceptual database model
- Conversion of conceptual database model into relational one

CREATION OF DATABASES AND TABLES

- Working with MySQL
- Basic queries
- Creation of MySQL tables
- Data insertion
- Data selection

JOINING THE QUERIES

- Selection of data from several tables
- Drilling down a database and aggregation functions

EDITING, UPGRADING AND REMOVING THE DATA

- Changing the table structure:
- Changing the data of strings
- Working with MySQL through PHP

CMS DRUPAL

INTRODUCTION TO CMS. INSTALLATION OF CMS DRUPAL

- The concept of CMS. The importance of studying the CMS
- Differences between CMS and Framework. Advantages and disadvantages: simplicity, speed of development, security, admin panel, speed of operation
- Types of CMS: free and paid. Advantages and disadvantages: maintenance, functionality, Web community, security, price
- Popular CMS: Drupal, Wordpress, Joomla, Bitrix

DRUPAL INSTALLATION. BRIEF INSIGHT. INSTALLATION OF MODULES

- Installation of Drupal
- Drupal admin panel — brief insight. Major tabs and their purpose: control panel, content, structure, design, users, modules, configuration and reports
- Modularization of Drupal. Overview of the list of kernel modules
- Installing and setting the themes
- Drush

DRUPAL ENTITIES. WORKING WITH USERS. WORKING WITH MATERIALS

- Drupal entities: users, node, fields, taxonomy, block
- Working with users
- Working with materials
- Additional modules of fields: date, link, email, field_group, yamaps, multiupload_filefield_widget, multiupload_imagefield_widget

ADDITIONAL ADJUSTMENT OF MATERIALS

- Taxonomy
- A reference to material
- Image display
- Synonyms of paths
- CKEditor
- The practice of blog creation

ADDITIONAL PAGES. ACCESS

- The Views module
- The practice of developing a news site

BLOCKS AND MENUS

- Regions and blocks
- Menu
- Developing a site backup
- The practice of developing a news site (creation of blocks)

CREATION OF EIGEN THEME

- Formal documentation on creation of themes
- Distribution of the mytheme.info file
- Overview of the theme files: template.php, logo.png, screenshot.png, favicon.ico
- Theming templates:
- Functions of the drupal kernel
- Representation of html in the form of arrays, theme and render functions
- Practice of developing the eigen theme

THE TEMPLATE.PHP FILE AND PREPROCESSORS

- Installation of the devel module. The dsm command
- Developing the eigen functions in template.php
- Materials theming, the node.tpl.php pattern
- template_preprocess_node preprocessor function
- template_preprocess_page preprocessor function
- template_preprocess_html preprocessor function
- Practice of developing the eigen theme (templating the materials)

DEVELOPING THE EIGEN MODULE. HOOKS

- Developing the eigen module. The mymodule.info. file distribution. The mymodule.module file
- The concept of HOOK. The principle of interaction between the modules
- The hook_init preloader
- The examples of hooks for working with materials and users
- Developing the pages by means of hook_menu
- Example of developing a module that counts a number of visits for each of the pages of the current user and displays it on the page using the $_SESSION array
- Working with a database and Drupal db API
- Working with materials and users
- Practice of developing a module that counts a number of visits for each of the pages of the current user and displays it on the page using a database

TICKET CREATION

- The drupal_get_form function of ticket generation
- Creation of eigen tickets
- Preservation of variables in databases: varaible_get, variable_set
- Overriding the tickets:
- Practice of survey-ticket creation collecting the statistical data and displaying a result in a separate page

THEMING. WORKING WITH AJAX

- The use of AJAX in tickets
- Creation of eigen templates by means of hook_theme

EXAM

- Creation of eigen module or theme

SUMMATIVE COURSE WORK ON BACK-END

SUMMATIVE PRACTICAL WORK ON THE COURSE