

Cambridge TECHNICALS LEVEL 3

IT

Cambridge
TECHNICALS
2016

Unit 21

Web design and prototyping

A/507/5024

Guided learning hours: 60

Version 2 - revised May 2016

*changes indicated by black vertical line

LEVEL 3

UNIT 21: Web design and prototyping

A/507/5024

Guided learning hours: 60

Essential resources required for this unit: Access to web authoring software that allows learners to write HTML, Javascript (or equivalent language), CSS and PHP. Learners may need access to a server and database that they can connect through using any appropriate MySQL software.

This unit is internally assessed and externally moderated by OCR.

UNIT AIM

Organisations are increasingly reliant on their websites to market goods or services and interact with clients and customers. As technology develops, so does the scope of functionality of websites and the importance of an effective design that meets the needs of the organisation. In this unit you will research, design and produce an interactive, responsive website that is specific to a client's needs, culminating in presenting the concept of the website using the prototype to the client. You will learn about the security risks in website design and how to minimise these threats. This unit will also allow you to incorporate existing interactive elements, as well as prototyping your own website.

This unit is optional within the Application Developer specialist pathway. Job roles within this pathway include web app developers as well as website designers, although these are different jobs with differing requirements, they do require similar skills, knowledge and understanding with respect to website creation and prototyping.

TEACHING CONTENT

The teaching content in every unit states what has to be taught to ensure that learners are able to access the highest grades.

Anything which follows an i.e. details what must be taught as part of that area of content. Anything which follows an e.g. is illustrative, it should be noted that where e.g. is used, learners must know and be able to apply relevant examples in their work, although these do not need to be the same ones specified in the unit content.

For internally assessed units you need to ensure that any assignments you create, or any modifications you make to an assignment, do not expect the learner to do more than they have been taught, but must enable them to access the full range of grades as described in the grading criteria.

| Learning outcomes | Teaching content |
|---|---|
| The Learner will: | Learners must be taught: |
| 1. Understand the fundamentals of web design | 1.1 Components of web design, i.e.: <ul style="list-style-type: none"> • domain name • the purpose or a site map • the use of hyperlinks to join webpages • the position, structure and purpose of a navigation bar • page design (e.g. navigation bar, title, page content, a plan for content management) • designing for different browsers and devices <ul style="list-style-type: none"> ○ responsive design for mobile/tablet technology ○ how browser rendering can affect the layout of a webpage ○ an understanding of browser rendering engines as a key to performance ○ importance of design that takes this into account, what can happen when it is not considered • World Wide Web Consortium <ul style="list-style-type: none"> ○ open and closed standards in web development • storage of data (e.g. linking to a database) • methods of user interaction <ul style="list-style-type: none"> ○ different methods of interactivity ○ use of existing tools ○ use of languages to add interactivity(e.g. Javascript, Flash) 1.2 Security risks, i.e.: <ul style="list-style-type: none"> • the need for security • threats (e.g. SQL injection, interception of data, un-validated input) • prevention (e.g. validation, appropriate passwords, encryption) |
| 2. Be able to plan the development of an interactive website for an identified client | 2.1 Analysing needs, i.e.: <ul style="list-style-type: none"> • list of requirements • purpose of site • content • user interactivity required (e.g. submission of data, maps) • responsive design requirements |

| Learning outcomes | Teaching content |
|---|--|
| The Learner will: | Learners must be taught: |
| | <p>2.2 Produce a plan, i.e.:</p> <ul style="list-style-type: none"> • site map • navigation bar • page structure • design (e.g. font, colour) • interactive elements to meet the client's needs • responsive design <ul style="list-style-type: none"> ○ for different devices, e.g. tablet, phone, PC ○ for different browsers, e.g. IE, Chrome, Safari |
| <p>3. Be able to create prototype websites for an identified client</p> | <p>3.1 Creating a prototype, i.e.:</p> <ul style="list-style-type: none"> • setting structure • adding content • inserting hyperlinks <p>3.2 Interactive elements, i.e.:</p> <ul style="list-style-type: none"> • existing <ul style="list-style-type: none"> ○ copy HTML code from pre-existing components (e.g. social media feeds, videos, maps) ○ editing to make these appropriate for a webpage (e.g. making a map local) • language (e.g. Javascript, Flash) <ul style="list-style-type: none"> ○ writing code to perform a function ○ allowing for user interaction (e.g. changing an image based on a user selection, validating input) • database <ul style="list-style-type: none"> ○ creating a database on a server ○ connecting a webpage to a database using PHP ○ writing data from a user input (e.g. completion of a form) using MySQL • CSS <ul style="list-style-type: none"> ○ responsive design <p>3.3 Testing to include, i.e.:</p> <ul style="list-style-type: none"> • checking content is appropriate, correct and complete • functionality <ul style="list-style-type: none"> ○ embedded components ○ programming language (e.g. Javascript, Flash) ○ database storage • comparison to requirements • responsive design <ul style="list-style-type: none"> ○ multiple devices ○ multiple browsers |

| Learning outcomes | Teaching content |
|--|---|
| The Learner will: | Learners must be taught: |
| | <p>3.4 Evaluate against client needs including, i.e.:</p> <ul style="list-style-type: none"> • comparison against requirements • how the prototype meets the site purpose (e.g. if e-commerce, how this has been incorporated) • comparison of prototype against content required • comparison of interactivity built in, against the user's interactive requirements • comparison of responsive design to user's responsive design requirements • justify choices made in the development of the prototype against the original needs • improvements - suggest improvements to the design, structure or function of the prototype |
| <p>4. Be able to present the interactive website concept to an identified client</p> | <p>4.1 Present the solution, i.e.:</p> <ul style="list-style-type: none"> • choose a suitable method of presentation (e.g. live demonstration, use of presentation software, report) • plan a presentation to incorporate: <ul style="list-style-type: none"> ○ comparison of website against requirements ○ demonstration of functionality ○ demonstration of interactivity ○ demonstration of responsive design ○ justification of design choices • present the solution to the client <p>4.2 Future security and maintenance considerations, i.e.:</p> <ul style="list-style-type: none"> • updating of content • training of staff • threats to information security • protection methods for securing personal data/information |

GRADING CRITERIA

| LO | Pass | Merit | Distinction |
|---|--|---|---|
| | The assessment criteria are the Pass requirements for this unit. | To achieve a Merit the evidence must show that, in addition to the pass criteria, the candidate is able to: | To achieve a Distinction the evidence must show that, in addition to the pass and merit criteria, the candidate is able to: |
| 1. Understand the fundamentals of web design | P1: Describe the key components of website construction | M1: Explain the security risks that must be considered when creating a website | |
| 2. Be able to plan the development of an interactive website for an identified client | P2*: Determine a client's requirements for a website <i>(*Synoptic assessment from Unit 1 Fundamentals of IT, Unit 2 Global information)</i> | | |
| | P3: Produce a plan for the website that meets the client's requirements | | D1: Justify the use of components in the website design that meets the client's requirements |
| 3. Be able to create prototype websites for an identified client | P4: Create a prototype of the website for the client | M2: Add interactive components to the prototype based upon the client's requirements | |
| | P5: Conduct testing of the prototype | | D2: Evaluate the prototype against the client's requirements |
| 4. Be able to present the interactive website concept to an identified client | P6: Create a presentation to demonstrate the prototype website to the client | M3: Communicate future website security and maintenance considerations to client | |

SYNOPTIC ASSESSMENT

When learners are taking an assessment task, or series of tasks, for this unit they will have opportunities to draw on relevant, appropriate knowledge, understanding and skills that they will have developed through other units. We've identified those opportunities in the grading criteria (shown with an asterisk). Learners should be encouraged to consider for themselves which skills/knowledge/understanding are most relevant to apply where we have placed an asterisk.

ASSESSMENT GUIDANCE

LO1 Understand the fundamentals of web design

This learning outcome is about the learners exploring the structure of a website and how components are combined to produce the finished product. It is important that the learners look at examples of websites to analyse how these are used effectively.

P1: The learners must describe the key components that make up website construction. Their descriptions must include web page and website structure, content and methods of user interaction including responsive design for a range of devices and browsers. Evidence can be in the form of a written report, presentation with detailed speaker notes, a video of presenting the information to an audience, or an information guide about designing a website.

M1: The learners must explain the security risks that must be considered when creating a website. They must identify threats to both accurate data storage and internal and external threats such as interception of a data transmission. Learners need to describe how prevention strategies can be integrated into a website design. This can build on the work in P1 with learners identifying components and website design elements that reduce security risks. The evidence can be in a written or verbal format e.g. a written report, presentation, audio or video recording of a presentation etc.

LO2 Be able to plan the development of an interactive website for an identified client

This learning outcome is about the learners investigating a client's requirements for a website. It is important that the scenario for the website allows learners to incorporate both interactivity and a responsive design, which will allow them to meet all of the assessment criteria.

P2: The learners must determine a client's needs for a website. They need to investigate the scenario and work with the client to determine their requirements. These should include items such as purpose, content (both text and image based), interactive elements (e.g. a form for submission of data, account to log into, purchase of items, a change in content based upon a user selection) and the increasing importance of responsive design to both different devices and browsers. The evidence can be in the form of a written report, presentation or recording of the requirements.

P3: The learners must produce a design plan for the website, based on the requirements they have identified in P2. The learners should produce a site map for the website and an annotated design template for the prototype that takes into account the required responsive design for the planned for browser and/or device. The learners will need to design the interactive elements, outlining how these will work. The evidence should be in the form of annotated drawings or electronic designs that identify the intended browser and device designed for. This plan would then enable a third party to produce the prototype

D1: The learners need to justify their design choices based upon the client's requirements. The learners need to compare the design produced in P3 to the requirements identified in P2. The evidence can be in the form of additions to P1 and P3, or as a separate written report, presentation or recording.

LO3 Be able to create prototype websites for an identified client

This learning outcome is about the learners producing and testing a prototype for the website design for LO2. This should include a number of webpages that are linked.

P4: The learners will need to create a prototype of the website for the client, which should have a number of linked webpages. The learners need to make sure this derives from the designs produced for LO2. Learners need to create a suitable structure, navigation, and content, including working hyperlinks. The evidence for this will be the prototype, either as a hosted website or as files that can be viewed and run locally.

M2: The learners are required to add different interactive components, as per their planned design. This can be added to the work produced for P4. The interactive elements need to link to the designs produced for LO2. The areas learners can add are; existing elements (pre-existing components that are inserted e.g. an interactive map, video, active weather forecast), JavaScript based (the learner may add code to perform specific functions, such as changing images, a submit button to e-mail a form), database (e.g. a log-in feature, storing data to a database) and CSS (e.g. creating a responsive website to different browsers or devices). The evidence for this will be the prototype produced and could be supported by a written report, presentation or video of the interactive elements.

P5: The learners are required to test the prototype. They need to ensure that all elements of the prototype work correctly, including; hyperlinks, interactive elements (if M3 is complete) and responsive design (if M3 is complete) as per their plan. The evidence for this should be in the form of their test plan.

D2: The learners are required to evaluate their prototype that they created for P4 and M2. The evaluation needs to include the bullet points listed in the teaching content. The evidence for this could be a documented evaluation in the form of a written report, presentation with detailed speaker notes, or a video of the learner presenting the results of their evaluation.

LO4 Be able to present the interactive website concept to an identified client

P6: The learners need to present the concept of the website, using the prototype, to an identified client. The learners must prepare a suitable presentation including the bullet points listed in the teaching content. They then need to present their presentation to the client. The evidence for this will be found in the resources created for the presentation (video, presentation with detailed speaker notes) and evidence of giving the presentation (e.g. a recording of the presentation).

M3: The learners are required to communicate future website security and maintenance considerations to their client. The learner should consider how the website will change over time and therefore it is important to update information, training needs and security measures on a regular basis. The evidence could be an extension of P6 and be in the form of a report or presentation with detailed speaker notes.

Feedback to learners: you can discuss work-in-progress towards summative assessment with learners to make sure it's being done in a planned and timely manner. It also provides an opportunity for you to check the authenticity of the work. You must intervene if you feel there's a health and safety risk.

Learners should use their own words when producing evidence of their knowledge and understanding. When learners use their own words it reduces the possibility of learners' work being identified as plagiarised. If a learner does use someone else's words and ideas in their work, they must acknowledge it, and this is done through referencing. Just quoting and referencing someone else's work will not show that the learner knows or understands it. It has to be clear in the work how the learner is using the material they have referenced **to inform their** thoughts, ideas or conclusions.

For more information about internal assessment, including feedback, authentication and plagiarism, see the centre handbook. Information about how to reference is in the OCR *Guide to Referencing* available on our website: <http://www.ocr.org.uk/i-want-to/skills-guides/>.

EMPLOYABILITY SKILLS

| Employability skills | Learning outcome |
|----------------------|--|
| Communication | P2, P6 |
| Problem solving | P2, P3, M2, P4, M3, |
| Time management | P1, P2, P3, P4, P5, P6, M1, M2, M3, D1, D2 |
| Critical thinking | P5, P6, M1, D1, D2 |
| Decision making | P2, P3, P4, P5, P6, M2, M3 |

MEANINGFUL EMPLOYER INVOLVEMENT - a requirement for the Diploma (Tech Level) qualifications

The 'Diploma' qualifications have been designed to be recognised as Tech Levels in performance tables in England. It is a requirement of these qualifications for centres to secure for every learner employer involvement through delivery and/or assessment of these qualifications.

The minimum amount of employer involvement must relate to at least one or more of the elements of the mandatory units.

Eligible activities and suggestions/ideas that may help you in securing meaningful employer involvement for this unit are given in the table below.

Please refer to the *Qualification Handbook* for further information including a list of activities that are not considered to meet this requirement.

| Meaningful employer involvement | Suggestion/ideas for centres when delivering this unit |
|--|---|
| 1. Learners undertake structured work-experience or work-placements that develop skills and knowledge relevant to the qualification. | Learners could create a website for the employer whilst on a work-placement. The centre would need to support the technical skills, and documentation required at each stage, but a live website could be implemented for the employer. |
| 2. Learners undertake project(s), exercises(s) and/or assessments/examination(s) set with input from industry practitioner(s). | You could set a project with a local employer – the employer could be the client for the website they could be asked to provide details of their website requirements and sample content for the learners to work from. |
| 3. Learners take one or more units delivered or co-delivered by an industry practitioner(s). This could take the form of master classes or guest lectures. | A web development employer could teach the learners the technical elements of this unit, for example JavaScript or SQL/PHP programming. |

To find out more

ocr.org.uk/it

or call our Customer Contact Centre on **02476 851509**

Alternatively, you can email us on **vocational.qualifications@ocr.org.uk**



OCR is part of Cambridge Assessment, a department of the University of Cambridge.

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored. ©OCR 2015 Oxford Cambridge and RSA Examinations is a Company Limited by Guarantee. Registered in England. Registered office 1 Hills Road, Cambridge CB1 2EU. Registered company number 3484466. OCR is an exempt charity.