COMP1687 (2019/20)	**Web Application Development**	**Header ID: 300316**	**Contribution: 100% of course**
Coordinator: Dr Mahtab Hossain			**Deadline Date: Thursday 12/12/2019**
This coursework should take an average student who is up-to-date with tutorial work approximately 50 hours. Feedback and grades are normally made available within 15 working days of the coursework deadline.			
Learning Outcomes: Use client-side technologies for building, usable, accessible, standard compliant web pages. Use server-side technologies for building secure, stateful, database driven web applications. Describe and critically discuss the design, engineering, legal, social, ethical and professional issues and considerations involved in web application development.			

Plagiarism is presenting somebody else's work as your own. It includes: copying information directly from the Web or books without referencing the material; submitting joint coursework as an individual effort; copying another student's coursework; stealing or buying coursework from someone else and submitting it as your own work. Suspected plagiarism will be investigated and if found to have occurred will be dealt with according to the procedures set down by the University.

All material copied or amended from any source (e.g. internet, books) must be referenced correctly according to the reference style you are using.

Your work will be submitted for electronic plagiarism checking. Any attempt to bypass our plagiarism detection systems will be treated as a severe Assessment Offence.

Coursework Submission Requirements

- An electronic copy of your work for this coursework must be fully uploaded by **23:30 p.m.** on the Deadline Date of **Thursday 12/12/2019** using the link on the coursework Moodle page for COMP1687.
- For this coursework, you must submit a single Acrobat PDF document. It MUST contain the self-assessment sheet as the first page [just after the cover page]. Your developed "Web Application" should be hosted inside stuweb.cms.gre.ac.uk for access. One single ZIP file of your web application should also be uploaded.
- In general, any text in the document must not be an image (i.e. must not be scanned) and would normally be generated from other documents (e.g. MS Office using "Save As ..PDF"). An exception to this is hand-written mathematical notation, but when scanning do ensure the file size is not excessive.
- There are limits on the file size. Please ensure that you meet that.
- Make sure that any files you upload are virus-free and not protected by a password or corrupted otherwise they will be treated as null submissions.
- Your work will be marked online and comments on your work and a provisional grade will be available from the Coursework page. The grade will be made available in the portal.
- You must NOT submit a paper copy of this coursework.
- All coursework must be submitted as above.

The University website has details of the current Coursework Regulations, including details of penalties for late submission, procedures for Extenuating Circumstances, and penalties for Assessment Offences. See http://www2.gre.ac.uk/current-students/regs.

Detailed Specification

This coursework is worth 100% of the total marks for this course.
This coursework must be completed individually.

Please read this *entire* specification very carefully so that you are fully aware of the requirements.

Group work or work within a development team is an integral part of Higher Education learning for Computer Science or Computing students. Assessing group work sometimes poses challenges in terms of identifying an individual's contribution within a group. You are asked by University of Greenwich's learning management team to implement a peer assessment system (website) to aid the tutor for assessing group work. This is expected to be a first prototype with limited functionalities: i) each student should be able to rate all members within a group, ii) the tutor should be able to view the ratings of each student by all the group members, and iii) students should be notified of the final grade (via email) of all members of a group after all the members' are rated by their peers, or be reminded to complete the peer assessment task otherwise (also via email) by the tutor.

To implement the site you ***must*** use XHTML 1.1/HTML5, CSS and JavaScript for the client-side coding. HTML5 extensions are permitted but should be identified and justified in the documentation. PHP ***must*** be used for the server side coding. The site ***must*** run from the Unix Apache web server stuweb.cms.gre.ac.uk and the MySQL database server mysql.cms.gre.ac.uk provided by the department.

Functionality to be achieved

The above required functionalities are expressed to be implemented as a number of levels. The functionality implemented in your application will determine the ***maximum possible*** mark that you can achieve. The actual mark awarded depends strongly on the quality of your work. Make sure that you fully understand the grading criteria.

It is recommended that in designing your websites (and databases) you should allow for all of the features to be implemented. In building the websites each level should be attempted in increasing order. Starting with level 1 you should incrementally enhance your work to include the next level.

Please note the following assumptions:
The website should be implemented only for a particular group task assigned by a tutor. The number of students (30) is fixed – so also the number of students per group (3 students per group). In other words, there will be two types of actors for the system – 1) tutor (only one tutor) and 2) students. This single tutor should be pre-registered inside your system (i.e., already existing) with ID 000000000 and password 000000000.

Level 1: Account creation, and login: 15 marks
Create an XHTML/HTML5 form that allows students to create an account. The form must include only 5 pieces of information from the student; their 9-digit IDs, their chosen password, their email address, a CAPTCHA string, and the group that they want to select (e.g., this can appear as a selection between 1-10 since there will be 10 groups based on the assumptions above). Account details are to be stored in your MySQL database.

The system must prevent duplicate IDs being chosen. If a group already has 3 members, then the student should be restricted to enrol in that group. Member passwords should be stored in the database in an encrypted format. The email address should follow valid format. You may use one of the many open source CAPTCHA systems or use the one taught in lecture or write your own (beware reCAPTCHA is less than friendly and presents usability issues without JavaScript).

For login, provide an XHTML/HTML5 login form that allows returning members to authenticate with the site using their ID and password. These credentials should be compared with the information recorded in your MySQL database. Note that the pre-registered single tutor should also be using the same login form.

Note: You will need to initiate some form of session state to prevent unauthorised access to member activity within the site. Authentication credentials should be protected from interception in transit. You will find it useful to implement some form of logout mechanism if you are to be able to test this login process.

Level 2: Student tasks: 15 marks
Upon login, the student should see the members within the same group who are already registered. The system should allow the student to rate his/her group members. Provide XHTML/HTML5 form for this purpose containing the option to give a numeric grade (between 0 and 10), a textual description justifying the numeric grade (e.g., this group member did not show up in the meetings, missed his/her assigned deliverables or may have worked diligently, etc.), and an image (just for fun – this can be any image of small sizes, e.g., emojis). However, do not force the member to upload an image though (keep it optional). The student should have provision to save the peer evaluation without finalising it, i.e., he/she can later edit/change it during a different login instance. There should be provision to delete the saved peer evaluation also. However, once finalised, the student will no longer have provisions to either edit or delete a particular peer evaluation.

Remember for textual description, some characters (notably the apostrophe) can cause problems with your SQL strings (prevent SQL injection).

Level 3: Tutor tasks: 30 marks
Upon login, the tutor should be able to view all the groups, and the registered members within each group. The tutor should also be able to view individual student's overall profile that will contain his/her ID, overall grade that is computed as an average from his/her peer's given ratings, also the individual grades given by the peers with textual justification and image (if available). Note that the tutor's view (i.e., what the tutor will see) will be based upon the finalised peer evaluations only.

Provide a means for tutors to search for a particular student's peer evaluation (search by ID) or by a numeric grade (e.g., search all students who have achieved an overall numeric grade over/under 5). Search results must be returned in a paginated list brief format where each entry in the list can be clicked to show full details of the matching string (e.g., if only a substring of ID is provided, that may be matched against multiple student IDs).

Search results should be filterable to sort by, for example, lower to higher (or higher to lower) while searching via numeric grade.

Note: Result lists may become lengthy (e.g, searching with an empty string may return all the existing entries of your database), and therefore must be paginated. Make sure that you have sufficient items in your database to demonstrate pagination.

The tutor should have the option to send the completed group's grades via email – one email sent to all group members. Keep the body of the email concise, e.g., only the ID and corresponding overall grade). Note that there should be six finalised peer evaluations in order to be a completed group. The tutor should also have the provision to send reminder emails to an incomplete group's members (again keep it simple - one email sent to all members in the group).

Level 4: Cookie: 5 marks
Use a cookie to remember the member's ID but not the password for the login form of Level 1. In addition use a cookie to remember the last search term. Sites that store cookies must conform to EU cookie law (e-privacy directive).

Note: This could be implemented using either client side or server side code. While cookie handling is arguably implemented rather better in PHP than JavaScript, you must bear in mind that the cookie is stored on the client and server side manipulation of a cookie can therefore be problematic.

Level 5: Usability: 5 marks
The developed application should incorporate the contemporary issues of Web development in terms of user experience (i.e. usability). For example, is it responsive/adaptive to address device heterogeneity issues for access? How is the Web interface's information architecture in terms of finding relevant items and navigation? Have contemporary issues of Web development been addressed?

Level 6: LSEPi consideration: 25 marks
You have used Cookie in level 5. If Cookie is used in a European Union website, it generally displays a 'Cookie Consent' notice (e-privacy directive) to the visitor. In the context of this scenario [Cookie], please discuss the Legal, Social, Ethical and Professional (LSEP) issues and considerations (LSEPic) and implications that may arise in Web development that uses Cookie. You may wish to extend your discussion to include Political, Philosophical and Economic issues and considerations (PPEic) as well. Your discussion should address both general and specific LSEPi and PPEi in the context of Cookie usage in a Web application.

This discussion must be suitably structured, written in your own words, and develop a clear narrative or argument using appropriate language. All assertions are expected to be supported by references (using Greenwich Harvard formatting) or otherwise justified.

The discussion should be within 2,000 words plus or minus 5% (100 words) not including the title page or any preamble and not including the references.

If you are in any way unclear about this specification you should discuss this with your tutor.

Use of tools

You are free to use web authoring tools such as Brackets or NetBeans to aid your productivity. If you wish, you may make use of WYSIWYG tools such as Dreamweaver or Expression Web. Do not become distracted into spending valuable time on the appearance of your work or gold plating the specification. Be careful when using code generators that you understand the code that is being generated.

Remember that your application must operate correctly in a range of desktop, pad and mobile browsers such as Mozilla, Chrome, Android and Internet Explorer, with and without JavaScript enabled.

Borrowed material

In creating your websites you are expected to borrow code, text content, images and so on. Be careful when using borrowed code such as PHP or CSS frameworks (e.g. Laravel, Symfony, Bootstrap) that you understand the code and it functions correctly from the specified deployment server. All borrowed material *must* be clearly identified. Include comments in your source code to clearly identify what code you have borrowed and where you borrowed it from (even if you have adapted the code for your own use). Your code sources must also be identified in your submission. Referencing code sources in your submission is not sufficient on its own. Copyright *must* be acknowledged where appropriate. Failure to correctly reference your sources may be considered as plagiarism.

Deliverables

A. **On Thursday 21st November** there will be a peer assessment exercise in which students working in groups of three will assess each other's implementation of levels 1 and 2. A peer assessment sheet is attached to this document (the page before last). This will be provided in the exercise as hard-copy too. This sheet must be completed by you and your peer assessors and handed to your tutor during the peer assessment exercise. Your tutor may ask to confirm the accuracy or otherwise of the peer assessment. Your tutor will moderate the peer assessment. This exercise is extremely important, and will provide formative feedback for your developed application so far.

B. A PDF document submitted by the due date containing the following sections **IN THE ORDER** given below. Do not include any other information. Do not include all of your source code.

1. A cover page.
2. A completed self assessment sheet (see end of this document).
3. A statement of the functionality that you have achieved as described in the specification. If you have not achieved all of a certain level then specify the sub-parts of it e.g. all of level 1, 2 and 3 plus some of level 4.
4. A description of any bugs in your program (all software has bugs!). Bugs declared in here will lose fewer marks than ones that you don't declare!
5. Level 6's article.

Your developed "Web Application" should be hosted inside stuweb.cms.gre.ac.uk for access. One single ZIP file of your created web application should also be uploaded via Moodle submission page.

C. After you have submitted your coursework, you are required to attend a viva to examine your system in operation and answer questions about it. This will be used to both assess the level of functionality and the authenticity of your work. Failure to attend a viva will result in loss of marks for levels 1 to 5. You will be sent an email to reserve a slot with your tutor after the coursework upload. Your tutor will moderate your self assessment (deliverable B.2) during your coursework viva. Marks are available for the accuracy of your self-assessment.

Note that "the tutor" actor MUST be pre-registered inside your system with specified ID (000000000) and password (000000000). You should also ensure there are enough data (e.g., other registered students) to show the required functionalities properly.

Guide notes on completion of the assessment sheet are included in this document. When completing the assessment sheet you should bear in mind that your tutor is looking for honesty and accuracy.

Be advised that you will be required to set up and run your applications from the specified web server and database server. You should therefore make sure that your work is set up and tested well in advance so that you do not waste time trying to make it work during the viva. You are strongly advised to develop your work directly on the specified deployment servers as opposed to working offline and then porting your work.

Assessment Criteria

In terms of the developed Web application (Level 1-5):

The marks are awarded for:

The functionality that you have achieved. Have you achieved all specified functionality or only some? How well have you achieved the functionality? Have you incorporated any features that were not explicitly included in the requirements but add value to the site? Have you added features that contravene the specification? Have you added features that were not explicitly included in the requirements but detract from the usability of the site?

The usability of the application. Is the application easy to use? Is it obvious to the user at each stage what the user needs to do next? Are all messages to the user clear and unambiguous? Is the layout consistent and easy to read? Is navigation though the application clear and straightforward?

The accessibility of the application. Does the application try to follow WAI and Section 508 accessibility guidelines?

The reliability of the application. For example, if it throws an exception every time the user enters invalid input you will lose marks. Faults that you admit to on your bug list (see deliverables) will be looked on more kindly than those that are not declared.

The security of the application. For example, is the database protected from unauthorised access and alteration, is it open to SQL or script injection. Is sensitive data protected in transit? How difficult is it to hack your application? Security holes that you admit to on your bug list (see deliverables) will be looked on more kindly than those that are not declared.

The scalability of the application. For example, is the database appropriately normalised. Will the system be usable with one thousand entries in the database? Will the system be usable with one million entries in the database? Are queries paginated at the database, in the middleware or at the client?

The quality of your code. Have you included meaningful comments, used sensible naming standards (e.g. for variables, functions and files) and code layout (e.g. indentation to make the structure clear). Is the code well structured or a tangle? Have you clearly identified borrowed code with the original source?

Does your application operate correctly on all of the required browsers? Is the page layout elastic, responsive or adaptive? If any features fail on a particular browser, does it fail gracefully or become unusable? Is it usable without CSS? Without JavaScript? Without images?

Appropriate use of technologies, for example, is user data validated on both the client and the server? Has a sensible choice of validation priority been made? Is the validation effective? The specification is intentionally open so that you can decide to a certain extent how to implement each feature.

You MUST ensure the following:

Your code should run from the required web and database servers as mentioned in this specification.
Attend the viva with your tutor.
Submit the coursework documentation by the deadline electronically.

In terms of the submitted LSEPi discussion (Level 6):

Marks are awarded in ***equal*** measure for the following ***five*** criteria.

The quality of the language used. Is the language clear and unambiguous or is it difficult to follow, with poor sentence structure and grammatical errors? Is the language at an appropriate level using a technical vocabulary or is it too simplistic or overly familiar?

The structure. Is the text in a single paragraph or is it organised into sections and subsections? Are the paragraphs and sections sensibly chosen? Is the text overly compartmentalised? Is there a narrative or argument or is it merely a collection of facts and assertions? Is the content contextualised or just a collection of bullet points?

The quality of the content. Is there adequate discussion of legal, social, ethical and professional matters or perhaps only one of these four? Are they discussed superficially or does the discussion have depth and demonstrate understanding of how these aspects are interrelated? Are more interesting or important aspects discussed?

The scope of the discussion. Does the account provide generic, specific and reflective discussion of the subject or only one of these three? Are these discussed separately or contextualised to demonstrate understanding and insight?

The academic standard of the writing. Is it entirely original or is there evidence of pasted content? Are citations provided to support facts and assertions? Are references provided to match the citations? Are all references cited in the article? Are the references appropriately formatted?

Coursework: Practical (Development of a Web Application) + LSEPi Discussion, Year 3 BSc Level 6							
Criteria for Assessment	**80-100 Exceptional**	**70-79 Excellent**	**60-69 Very Good**	**50-59 Good**	**40-49 Satisfactory**	**30-39 Fail**	**0-29 Fail**
Practical [Development of a Web Application] **- Content, Knowledge and Understanding of Server and Client side Technologies of Web Development (AD1)** **- Range and Relevance of Research Informed Evidence of Web Technologies (AD2)** **[75 marks]**	Demonstrates exceptional systematic understanding of client and server side technologies of Web development. There is exceptional evidence of engagement with all key elements.	Demonstrates excellent systematic understanding of client and server side technologies of Web development. There is excellent evidence of engagement with all key elements.	Demonstrates very good understanding of client and server side technologies of Web development. There is also very good evidence of engagement with all key elements.	Demonstrates good understanding of client and server side technologies of Web development. There is also good evidence of engagement with all key elements, with some omissions in detail.	Client and server side technologies required for Web development are demonstrated with limited accuracy and several omissions. There is limited evidence of engagement with all key elements. Overall a satisfactory attempt at this criteria.	Confusion about client and server side technologies required for Web development and several omissions. There is insufficient evidence of engagement with each key element. There is a clear lack of criticality needed at level 6.	Very Confused about the client and server side technologies of Web development with many omissions. There is no evidence of criticality needed at level 6.
LSEPi Discussion (Content and Scope) **Evidence of research into LSEPi perspective of Web development, and critical judgements and interpretations, and persuasive argument which demonstrates intellectual clarity (AD3).** **[10 marks]**	An exceptional ability to devise and sustain a comprehensive argument. You critically evaluate the research you have undertaken in the field of the LSEPi perspective of Web development.	An excellent ability to devise and sustain a comprehensive argument. You critically evaluate the research you have undertaken in the field of the LSEPi perspective of Web development.	You demonstrate a very good ability to devise and sustain a clear argument. In places you do a very good job of critically evaluating much of the research you have undertaken in the field of in the field of the LSEPi perspective of Web development.	You demonstrate a good ability to devise and present a mostly clear argument. There is some good evidence of critical commentary in places on aspects of current research in the field of the LSEPi perspective of Web development, although it can be descriptive in places.	A satisfactory ability to present some elements of an argument using your understanding of the knowledge you have researched around the LSEPi aspects of Web development. There is satisfactory evidence of some critical commentary in places on aspects of your research, although it is too descriptive.	Little in the way of argument is provided to demonstrate your understanding of knowledge available on LSEPi perspective of Web development. There is very little (if any) critical commentary presented and research.	No argument is provided to demonstrate your understanding of knowledge available on LSEPi perspective of Web development. Any commentary is descriptive and does not demonstrate level 6 criticality.

LSEPi Discussion (Language and Structure) **The discussion is written in coherent standard English, is well structured and well presented in an appropriate academic style (AD4).** **[10 marks]**	This assessment is exceptionally well structured and organised. The written English is of an extremely high standard and observes all academic conventions in style and content. The discussion flows exceptionally well and is a pleasure to read.	Excellent structure and very well organised ides. The written English is of a very high standard and the work observes all academic conventions in style and content. Excellent flow and style and a pleasure to read.	A very good structure – with clear presentation and organisation of ideas. The work observes almost all academic conventions in style, content and is presented well, mostly using Standard English throughout. The majority of this work uses a style which flows well.	A good structure for the most part. The work observes many academic conventions in style and content and is mostly presented in Standard English, with some errors and omissions. Some sentence structure also needs revision and this can affect the flow of your work in places.	The structure is satisfactory overall but does need improvement. Many errors appear in the use of Standard English (possibly due to poor proof reading). The work does not flow well in several places and this affects clarity.	Little structure and it is hampered by errors in Standard English. It lacks academic style and does not flow well. Further proof reading clearly needed and additional support for academic writing. *The student should refer themselves to student services for additional support in their writing.*	No structure presented and the assessment includes a significant number of errors in Standard English. It lacks academic style and this impedes flow. Further proof reading clearly needed and additional support for academic writing. *The student should refer themselves to student services for additional support in their writing.*
LSEPi discussion (Academic Quality) **Referencing, sourcing, acknowledgement and sourcing is correct (AD5).** **[5 marks]**	Sources used are, without exception, acknowledged in the text and the reference list/bibliography, using correct citation – including online sources. Follows an exceptionally strongly professional approach to academic practice. Bibliography is also exceptional in its breadth and depth and all sources are primary sources.	Sources used are all acknowledged in the text and the reference list/bibliography, using correct citation – including online sources. Follows an excellent, professional approach to academic practice. Bibliography is also excellent in its breadth and depth and all sources are primary sources.	Sources used are almost all acknowledged in the text and the reference list/bibliography, mostly using correct citation – including most online sources. A very good approach to academic practice. Bibliography is very good in its breadth and depth and most sources are primary sources.	Literature is not always correctly referenced within the text and/or reference list/bibliography. Almost all texts are included in bibliography. Reading list is good in terms of number of sources but there are several secondary sources.	The assignment includes citations within the main body and has a reference list /bibliography. However this referencing is often inaccurate and/or there are several omissions. Reading list is short and limited. An over reliance on secondary sources.	The reference list/bibliography has many errors in its layout. Many references in the main text are incomplete or incorrect, and may be missing from the bibliography. You need further support with this.	The assignment lacks a reference list/ bibliography or it is incorrectly laid out. Referencing system within the assignment (i.e. Harvard) has not been followed and you need further support with this.

Grading Criteria

The specification is given as six levels. Marks for each of the six individual levels are provided with the level specifications above, making a total of 95%. The accuracy of your self assessment is worth up to 5%.

Note that the mark you achieve as defined in each level specification sets the maximum possible mark, you may get a mark lower than the maximum possible for each level that you implement depending on how well meet the assessment criteria. Factors that may be taken into account when awarding a grade are described above in the assessment criteria.

The self assessment sheet below requires that you record a grade for each level as a number between 0 and 10. The weighting for each level is applied later.

8 … 10	Exceptional in all elements.
7	Excellent in all elements.
6	Very good overall standard
5	Good, largely meets the requirements
4	Satisfactory, achieves the learning outcomes
3	Fail, not acceptable, achieved some learning outcomes
0 … 2	Fail, does not meet level 6 undergraduate degree standard.

COMP1687 Peer Assessment Sheet for the 201920 Coursework

Assessed student: _____ **Student ID 00** _____ **Sign**_____

Peer student : _____ **Student ID 00** _____ **Sign**_____

Peer student : _____ **Student ID 00** _____ **Sign**_____

URL

`http://stuweb.cms.gre.ac.uk/~`_____

Student Use													
		Total Mark	Please circle ONE of the grades (0 to 10) for each level below [Level 1 and 2]										
Level 1	Account creation & login	15	0	1	2	3	4	5	6	7	8	9	10
Level 2	Student tasks	15	0	1	2	3	4	5	6	7	8	9	10

Comments

What the student did well in this assignment?

What the student could improve in this assignment?

What the student can take forward to your next assignment?

COMP1687 Self Assessment Sheet for the 201920 Coursework
This sheet must be completed and submitted with your coursework

Student name: _____ Student ID 00 _____

URL
`http://stuweb.cms.gre.ac.uk/~`_____

Student Use												
		Total Mark	Please circle ONE of the grades (0 to 10) for each level below [Level 1 to Level 5]									
Level 1	Account creation & login	15	0	1	2	3	4	5	6	7	8	9	10
Level 2	Student Tasks	15	0	1	2	3	4	5	6	7	8	9	10
Level 3	Tutor Tasks	30	0	1	2	3	4	5	6	7	8	9	10
Level 4	Cookie	5	0	1	2	3	4	5	6	7	8	9	10
Level 5	Usability	5	0	1	2	3	4	5	6	7	8	9	10
Staff Use												
Self-assessment		5	0	1	2	3	4	5	6	7	8	9	10
Level 6	LSEPi discussion	25										

Comments:

What the student did well in this assignment?

What the student could improve in this assignment?

What the student can take forward to your next assignment?