BSc (Hons) Computer Science with Combined Studies

Programme Specification

2023-2024

Contents

1. INTRODUCTION

This document describes the **BSc Computer Science with Combined Studies** awarded by Richmond University American University in London, using the protocols required by *The Framework for Higher Education Qualifications in England, Wales, and Northern Ireland* (QAA, 2014).

The degree is delivered within the framework of a US Liberal Arts undergraduate degree programme. Typically, students the programme which over 3.5 to 4 years (approximately 10 courses per year, with summer courses allowing for accelerated progress in some cases). Each undergraduate credit is equivalent, approximately, to 1 classroom contact hour per 15-week semester. On this basis, students are required to earn a total of a minimum 120 US academic credit hours in order to complete their degrees. Of the courses in the programme, half are at the "lower-division" taken in the first two years of study and coded 3000-4999, and half are at the "upper division", taken in years three and four, and coded 5000-6999.

The degrees are also articulated in terms of UK Regulatory Frameworks, chiefly the *FHEQ* and the *Higher Education Credit Framework for England*. Each course has been assigned to an appropriate level on the *FHEQ*, based on the course's learning outcomes and assessment strategies (note that the courses comprising the first year of the 4-year US undergraduate degree are normally at RQF Level 3). US undergraduate credit can generally be translated to ECTS and UK CATS credits in the following manner: 1 US credit = 2 ECTS credits = 4 UK CATS credits. So a US degree of 120 credits would translate as 240 ECTS credits and 480 UK CATS credits (with a minimum of 360 UK CATS credits at Levels 4-6 on the FHEQ).

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each course can be found in course specification documents and syllabi.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.

2. OVERVIEW

Programme/award title(s)	BSc (Hons) Computer Science with Combined Studies
Teaching Institution	Richmond American University in London
Awarding Institution	Richmond American University in London
Date of last validation	13 Dec 2021
Next revalidation	2026
Credit points for the award	120 US Credits 480 UK Credits at *FHEQ* Levels 3-6 (120 at Level 3; 120 at Level 4; 120 at Level 5; 120 at Level 6)
UCAS Code	University Code: *CODE*
Programme start date	Fall 2022
Underpinning QAA subject benchmark(s)	Computing (2019)
Professional/statutory recognition	N/A
Language of Study	English
Duration of the programme for each mode of study (P/T, FT,DL)	FT
Dual accreditation (if applicable)	Middle States Commission on Higher Education (First accredited 1981; renewed 1996, 2006, 2016). QAA – Higher Education Review (AP) 2017
Date of production/revision of this specification	May 2023 (see chart at the end of this document for list of revisions)

3. ABOUT THE PROGRAMME

The **BSc Computer Science with Combined Studies** degree aims to provide students with a broad range and knowledge in the general areas of computer science and also provide them with an opportunity to develop specialisms in the last year of their 4-year degree. This degree programme enables our students to respond to the demand for skills and knowledge required to act as programmers, software engineers, web developers, data analysts, and general IT related employment in the private or public sector. Students acquire a solid foundation in generic computing technology and specialised contextual knowledge in programming throughout the course of their studies.

BSc Computer Science with Combined Studies degree enjoys several distinctive features. The programme is staffed by an international faculty delivering courses to an international student body. Other key aspects, embedded within the Richmond's remaining programmes as well, include the relatively small class sizes across our curriculum. The small classes and our academic advising system make an important contribution to the quality of learning, as well as, providing plenty of opportunities for pastoral care as and when needed. Another distinctive feature of our programme is its strong emphasis on the liberal arts tradition. Our graduates in computer science would have benefited from courses from the arts, humanities, social and natural sciences. Exposure to several of these courses would have ranged in one or more courses at levels running all the way from foundation (freshman) to third (junior) years.

Some of our students make a decision to embark on a full-time, semester-long internship programme as well. These junior and senior students generally self-select into this programme, but are expected to have attained a B- average before their applications can be considered. Our internship office has dedicated staffing who enjoy a close working relationship with students, faculty and the many organisations with whom they have links.

4. MISSION

The Computer Science Major aims to prepare its students, through education and training, for challenging postgraduate and work-place opportunities in Computer Science, and its related fields, both in the UK and internationally. In pursuit of this, the Computer Science Major aims to encourage its students to become independent thinkers and develop strong analytical skills.

5. PROGRAMME STRUCTURE

BSc (Hons) Computer Science with Combined Studies

Please note that students must complete all Liberal Arts requirements AND a minimum of 120 credits at each FHEQ level. The Liberal Arts programme offers more choice amongst levels, so students and advisors must ensure that both Liberal Arts requirements and the overall level requirements are satisfied.

Black = Major requirements
Blue = General Education Liberal Arts Core requirements
Green = Electives/Gen Ed Electives

Table 1 Lower Division / Levels 3 and 4 Degree Requirements

LOWER-DIVISION REQUIREMENTS			
RQF Level 3		**US CREDITS**	**UK CREDITS**
DGT 3100	Fundamentals of Programming	3	12
DGT 3101	Foundations of Computer Science	3	12
MTH 3111	Functions with Applications	3	12
GEP 3105	Tools for Change	3	12
GEP 3180	Research and Writing I	3	12
Plus one of the following:			
GEP 3150	Visual Thinking	3	12
GEP 3170	Narratives of Change	3	12
Plus one of the following:			
ENV 3XXX	Any RQF Level 3 ENV Course	3	12
XXX 3XXX	RQF Level 3 Elective (only if satisfying ENV requirement at FHEQ Level 4)	3	12
Plus:			
XXX 3xxx	RQF Level 3 Elective OR MTH 3000 if student tests into this)	3	12
XXX 3xxx	RQF Level 3 Elective	3	12
XXX 3xxx	RQF Level 3 Elective	3	12
RQF Level 3 CREDIT TOTALS		**30**	**120**

FHEQ Level 4		**US CREDITS**	**UK CREDITS**
DGT 4101	Introduction to Programming	3	12
DGT 4102	Systems Architecture	3	12
DGT 4103	Data and Algorithms	3	12
DGT 4104	Web Development	3	12
MTH 4140	Maths of Argument and Reasoning	3	12
GEP 4105	Social Change in Practice	3	12
GEP 4180	Research and Writing II	3	12
MTH 4120	Probability and Statistics 1	3	12
Plus one of the following:			
ENV 4XXX	Any FHEQ Level 4 ENV course	3	12
XXX 4XXX	FHEQ Level 4 Elective (only if satisfying ENV requirement at RQF Level 3)		
Plus			
XXX 4XXX	FHEQ Level 4 Elective	3	12
FHEQ Level 4 CREDIT TOTALS		**30**	**120**

Table 2 Upper Division / Levels 5 and 6 Degree Requirements

UPPER-DIVISION REQUIREMENTS			
FHEQ Level 5		**US CREDITS**	**UK CREDITS**
DGT 5101	Programming for Applications	3	12
DGT 5102	Sustainable and Ethical Computing	3	12
DGT 5103	Computer Networks	3	12
DGT 5210	Cyber Security	3	12
DGT 5104	Systems Analysis and Design	3	12
Plus one of the following:			
DGT 5105	Advanced Computer Applications for Business	3	12
DGT 5106	Data Science	3	12
DGT 5107	Database Systems	3	12
Plus one of the following:			
GEP 5101	Service Learning: Digital Collaboration	3	12
GEP 5102	Service Learning: Leadership in a Changing World	3	12
GEP 5103	Service Learning: Environment and Society	3	12
GEP 5104	Service Learning: Global Citizenship and Migration	3	12
Plus			
XXX 5XXX	FHEQ Level 5 Elective	3	12
XXX 5XXX	FHEQ Level 5 Elective	3	12
XXX 5XXX	FHEQ Level 5 Elective	3	12
FHEQ Level 5 Credit Totals		**30**	**120**

FHEQ Level 6		***US CREDITS***	***UK CREDITS***
DGT 6101	Project Management for IT	4	16
DGT 6296	Senior Project 1	3	12
DGT 6297	Senior Project 2	3	12
plus 4 of the following:		16	64
DGT 6972	Internship	4	16
DGT 6962	World Internship	4	16
DGT 6103	Artificial Intelligence	4	16
DGT 6102	Data Mining	4	16
DGT 6104	Computer Graphics	4	16
DGT 6105	Games Technology	4	16
DGT 6106	Human Computer Interaction	4	16
PSY 6103	Brain and Cognition	4	16
Plus:			
XXX 6XXX	FHEQ Level 6 Elective	4	16
FHEQ Level 6 Credit Totals		**30**	**120**

6. PROGRAMME OUTCOMES

Programme-level learning outcomes are identified below. Please refer to the Curriculum Map at the end of this document for details of how outcomes are deployed across the study programme.

Key Programme Outcomes

Upon completion of the **BSc (Hons) Computer Science with Combined Studies** degree, students should be able to demonstrate skills in the following areas, as specified by the QAA:

- Computing-related cognitive skills
- Computing-related practical skills
- Generic skills for employability

The programme outcomes have been copied or adapted from the QAA benchmark statement for Computing.

Computing-related cognitive skills (A)

A1 demonstrate knowledge and understanding of computational thinking in the context of everyday life.

A2 demonstrate knowledge and understanding of the scientific approaches required to problem solve in the area of computer science.

A3 demonstrate knowledge and understanding of facts, concepts, principles, and theories relating to computing hardware and software.

A4 model knowledge and understanding of computer-based systems for the purposes of comprehension, communication, prediction, and understanding trade-offs.

A5 demonstrate understanding of requirements, practical constraints in the context of designing computer-based systems.

A6 use critical evaluation and testing approaches when designing and programming computer systems.

A7 know the methods, practices and tools required to deploy appropriate theory, practices and tools to meet the requirements of a design breif.

A8 recognise and apply any professional, ethical and legal practices relevant to computer technology and its development.

Computing-related practical Skills (B)

B1 specify, design, and construct reliable, secure, and usable computer-based systems.

B2 evaluate systems in terms of quality attributes and possible trade-offs presented within the given problem.

B3 plan and manage projects to deliver systems to meet requirements of a breif, timescale, and budget.

B4 ability to recognise any risks and safety aspects that may be involved in the deployment of computing systems.

B5 ability to use appropriate tools and programming language for the constructions of computer programmes.

B6 ability to document processes and practices in the process of problem solving using computers.

B7 analyse and solve complex problems within the context of computing including those with incomplete data.

Generic Skills for Employability (C)

C1 have gained, practiced, and evidenced a range of applicable employability skills.

C2 Intellectual skills: critical thinking; making a case; numeracy and literacy; information literacy. The ability to construct well-argued and grammatically correct documents. The ability to locate and retrieve relevant ideas, and ensure these are correctly and accurately referenced and attributed.

C3 Self-management: self-awareness and reflection; goal setting and action planning; independence and adaptability; acting on initiative; innovation and creativity. The ability to work unsupervised, plan effectively and meet deadlines, and respond readily to changing situations and priorities.

C4 Interaction: reflection and communication; the ability to succinctly present rational and reasoned arguments that address a given problem or opportunity, to a range of audiences (orally, electronically, or in writing).

C5 Team working and management: the ability to recognise and make best use of the skills and knowledge of individuals to collaborate. To be able to identify problems and desired outcomes and negotiate to mutually acceptable conclusions. To understand the role of a leader in setting direction and taking responsibility for actions and decisions.

C6 Contextual awareness: the ability to understand and meet the needs of individuals, business and the community, and to understand how workplaces, and organisations, are governed.

C7 Sustainability: recognising factors in environmental and societal contexts relating to the opportunities and challenges created by computing systems across a range of human activities.

7. TEACHING, LEARNING, AND ASSESSMENT

Teaching Strategy

The teaching and learning strategy adopted within the **BSc (Hons) Computer Science with Combined Studies** degree is based on the understanding that all students will be treated as active learners. Clearly, the precise approach will vary from course to course, depending on the learning outcomes relevant to each class.

The generic components of our teaching and learning strategy normally involves a variety of approaches and include delivering many of the following:

- Regular use of formal lecture sessions in all courses.
- Occasional workshops and seminars in some courses.
- Regular use of individual and/or team-based projects in all courses.
- Regular use of self-directed and directed reading in all courses.
- Peer-tutoring led by advanced students in many courses.
- Use of audio-visual and library resources in some courses.
- Regular use of tutor- and student-led discussion groups via e-learning platforms such as PowerCAMPUS (or Blackboard) in many courses.

The combination of teaching and learning approaches mentioned above develops our students' knowledge, thinking skills, and practical skills.

Their knowledge is acquired through:

- Structured lectures and supporting materials.
- Directed reading and use of internet materials.
- Independent research.

Their cognitive skills are developed through:

- Conducting research.
- Making presentations and preparing other assessments.
- Helping others to learn.

Their practical skills are gained through:

- Application of theory to practices encountered during internships.
- Using information technology to retrieve and manipulate data.
- Negotiating by means of team-based projects.

Their key skills are gained through:

- Employing and using appropriate linguistic skills.
- Independent learning.

Assessment Strategy

The assessment strategies used in the **BSc (Hons) Computer Science with Combined Studies** degree speak directly to how we anticipate progression with student learning to take place.

In terms of following up with the assessment of student learning and consistent with US liberal arts traditions, our classes rely on the system of continuous assessment on a course by course basis and throughout any given semester. This approach often involves the use of term-papers, portfolios of work, quizzes, mid-semester and final exams as well as student presentations and general class discussion. Not every component applies to every course, but most do relate to many of the classes that are offered. Many of our courses involve a site visit or require attendance at a public lecture as well. Students generally find these events to be extremely valuable to their learning.

Courses will follow the University Assessment Norms, details of which are listed in each CSD. See https://www.richmond.ac.uk/university-policies/ for full details.

Each senior completes 2 senior projects, each normally 5,000 words.

8. ENTRY REQUIREMENTS

Admissions

Details of the entry requirements, including English language requirements, may be found at the appropriate page of the University website listed below, where a comprehensive Admissions Policy and Summary of Practice document is also published.

https://www.richmond.ac.uk/undergraduate-admissions/

Transfer Credit

Prospective students with specific levels of subject achievement in Advanced Placement Tests, GCE, A Levels, and some other UK and international qualifications may enter with Advanced Credit and be given exemption from certain courses of the programme. Please see the Transfer Credit Policy Undergraduate for details.

9. EXIT AWARD REQUIREMENTS

An exit award is defined as a lower award than one for which the student is registered. Such an award may be conferred if a student completes part, but not all, of the requirements of the programme for which he or she is registered. Students may not enter the university registered for an exit award.

Associate of Arts Degree in General Studies (US)
The US Associate of Arts (AA) degree can be awarded as an exit degree for those students completing the following minimum requirements.

30 US / 120 UK credits at RQF Level 3
30 US / 120 UK credits at FHEQ Level 4

Of the total number of credits required for the AA degree, 30 US/120 UK credits must be completed at Richmond. Students must obtain a minimum cumulative GPA of 2.0 and a major of 2.0 in order to qualify for this degree. Latin Honours are not applied to the AA Degree.

The requirements for the AA degree are outlined in Table 1 above. All Level 3 and 4 Major and General Education Liberal Arts Core Requirements must be completed.

Certificate of Higher Education in Computer Science with Combined Studies (UK)

The UK Certificate of Higher Education (CertHE) can be broadly aligned with the US Associate of Arts Degree, but the CertHE does not require the completion of 30 US/120 credits at RQF Level 3. Students who qualify for the AA degree will automatically qualify for the CertHE. Students may qualify for a CertHE without fulfilling the requirements for a US AA degree if they have not completed all of the RQF Level 3 requirements necessary to obtain the AA.

The UK CertHE can be awarded as an exit award for those students completing the following minimum requirements.

120 credits at FHEQ Level 4

- Pass (normally a GPA of between 1.85 and 2.99 for all Level 4 courses)
- Merit (normally a GPA of 3.0 to 3.54)
- Distinction (normally a GPA of 3.55 and above for all level 4 courses)

Of the total number of credits required for the UK CertHE, 15 US/60 UK credits must be completed at Richmond.

The requirements for the UK CertHE are outlined in the section of Table 1 pertaining to FHEQ Level 4 requirements. All Level 4 Major and General Education Liberal Arts Core Requirements must be completed.

Diploma of Higher Education in Computer Science with Combined Studies (UK)

The UK Diploma of Higher Education (DipHE) has no US equivalent. The UK DipHE can be awarded as an exit award for those students completing the following minimum requirements.

120 credits at FHEQ Level 4
120 credits at FHEQ Level 5

- Pass (normally a GPA of between 1.85 and 2.99 for all Level 4 courses)
- Merit (normally a GPA of 3.0 to 3.54)
- Distinction (normally a GPA of 3.55 and above for all level 4 courses)

Of the total number of credits required for the UK DipHE, 15 US/60 UK Level 4 credits and 15 US/60 UK Level 5 credits must be completed at the University.

The requirements for the UK DipHE are outlined in the sections of Table 1 and Table 2 above pertaining to FHEQ Level 4 and FHEQ Level 5 requirements. All Level 4 Major and General Education Liberal Arts Core Requirements must be completed. Level 6 courses can be “dipped-down” to fulfil missing Level 5 credits.

Students may not be awarded more than one UK exit award and the University Examination Board will recommend the most relevant one for the individual student circumstance.

10. STUDENT SUPPORT AND GUIDANCE

There is a range of student support and guidance, for both academic and general wellbeing, available to students. This is accomplished through a range of programmes and services that positively impact learning as well as the total student life experience.

All students have an allocated full-time faculty member who acts as their academic adviser. Academic Advisers have on-going responsibility for students' academic progress, meeting with each advisee at least once per semester. Advisers assist students with registration, enabling smooth progression through the degree. Advisers also advise on postgraduate and career opportunities, and also provide pastoral support in many cases.

A range of Maths, English, Technology, and Writing workshops have been established to support students with particular needs in these areas. Librarians are on hand to assist with library use, which includes instruction in web-based resources.

The University endeavours to make all practical and reasonable adjustments to ensure students are able to fully participate in the University community. Students who declare a physical disability or a special educational need are supported to ensure the quality of their educational experience meets their individual requirements. SEN students, for instance, receive extra time in examinations, and have the option of writing exams on university-provided computers, and/or of taking exams in a separate room.

The University operates a well-staffed Student Affairs department that provides services intended to support and encourage student welfare, safety and development. This department oversees medical registration of students and provides counseling services. It also organizes a range of extracurricular activities and travel designed to further enhance students' educational experiences. Disciplinary and social grievance procedures are also overseen by this department.

11. PLACEMENT

The Internship Office the University offers a formal mechanism through which students may receive work-placement opportunities. These placements are supervised, career-related work experiences combined with reflective, academic study that help students apply theoretical knowledge in the workplace. Participation in the internship programme is optional, but students who choose to take up a placement receive academic credit for their placement and associated academic work (see level 6 options).

Expectations with regard to careers education, information, advice and guidance (as outlined in the section on Enabling Student Achievement in *The UK Quality Code for Higher Education*) are handled by the university's Student Affairs department. This department conducts a variety of career services for students, ranging from resource provision to a CV service, and in particular through the LEAD (Leadership, Education and Development) seminar series.

In addition to these services, the alumni office offers networking opportunties where students may contact alumni working in a variety of fields. The alumni office also offers these services via social media such as LinkedIn and Facebook.

12. STUDY ABROAD

Richmond students have the option to take a leave of absence and travel away from the university as a 'study abroad'. With over 40 partnerships spread over five continents, students are able to select from a wide range of partners. All courses taken elsewhere must be pre-approved by Registry Services.

13. REGULATORY FRAMEWORK

The **BSc (Hons) Computer Science with Combined Studies** is operated under the policy and regulatory frameworks of Richmond American University in London, the Middle States Commission on Higher Education, the Framework of Higher Education Qualifications, and the UK Quality Code for Higher Education.

Also key to the background for this description are the following documents:

- QAA (2018). The Revised UK Quality Code for Higher Education. (www.qaa.ac.uk)
- QAA (2021). Higher Education Credit Framework for England: guidance on academic credit arrangements in Higher Education in England.
- SEEC (2016). Credit Level Descriptors for Higher Education. Southern England Consortium for Credit Accumulation and Transfer (www.seec.org.uk).
- Middle States Commission on Higher Education. Standards for Accreditation and Requirements of Affiliation. 2014: Thirteenth Edition; Rev. Ed. 2015.

Ensuring and Enhancing the Quality of the Programme

The **BSc (Hons) Computer Science with Combined Studies** features detailed published educational objectives that are consistent with the mission of the institution**.** All course outlines contain course specific objectives that are regularly monitored by the individual instructors and by the faculty as a group.

The University has several methods for evaluating and improving the quality and standards of its provision. These include:

- External Examiners.
- Internal Moderation.
- Student representation.
- Curricular change approval process.
- Annual Programme Monitoring and Assessment.
- Formal Programme Review, every 5 years.
- Course evaluation.
- Student satisfaction surveys and the NSS.
- Feedback from employers.

BSc (Hons) Computer Science with Combined Studies is provided through a system of ongoing evaluations that demonstrate achievement of the programme's objectives, and uses the results to impr ove the effectiveness of the programme. Ongoing evaluation is carried out for both US (the Middle States Commission on Higher Education) and UK (QAA) reviews. The University is a voluntary subscriber member of the QAA, and underwent its first full Institutional Review in May 2013 and a Higher Education Review (AP) in 2017.

APPENDIX 1 Curriculum Map

		Computing-related cognitive skills (A)								Computing-related practical skills (B)							Generic skills for employability (C)						
		A 1	A 2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
Level 3																							
DGT 3100	Fundamentals of Programming		X				X			X				X	X					X			
DGT 3101	Foundations of Comp. Science					X											X	X					
MTH 3111	Functions with Applications		X											X	X			X					
Level 4																							
DGT 4101	Introduction to Programming		X				X			X				X	X				X	X			
DGT 4102	Systems Architecture			X	X	X					X						X						X
DGT 4103	Data and Algorithms		X		X									X		X						X	
DGT 4104	Web Development	X			X	X	X	X		X	X			X			X			X		X	
MTH 4120	Probability and Stats 1		X													X		X					
MTH 4140	Maths of Argument & Reason.		X													X		X					
Level 5																							
DGT 5104	Systems Analysis and Design	X				X	X	X			X	X	X		X		X		X			X	
DGT 5103	Computer Networks			X		X			X		X		X	X									X
DGT 5101	Programming for Applications		X	X			X			X				X	X			X					
DGT 5102	Sustainable and Ethical Comp.	X						X	X								X	X		X	X	X	X
DGT 5210	Cyber Security			X				X		X	X		X				X			X			
Plus 1 of the following																							
DGT 5105	Advanced Comp Apps for Bus.	X	X	X	X			X	X	X				X		X						X	X
DGT 5106	Data Science	X	X	X	X			X	X	X				X		X						X	X
DGT 5107	Database systems			X				X		X	X			X		X						X	
Level 6																							
DGT 6103	Artificial Intelligence		X	X			X	X	X	X				X		X		X	X				X
DGT 6296	Senior Project 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	

		Computing-related cognitive skills (A)								Computing-related practical skills (B)							Generic skills for employability (C)						
		A 1	A 2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
DGT 6297	Senior Project 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
plus 4 of the following:																							
DGT 6902	Internship																X	X	X	X	X	X	X
DGT 6901	World Internship																X	X	X	X	X	X	X
DGT 6101	Project Management for IT					X		X			X	X	X		X		X	X	X	X		X	
DGT 6102	Data Mining		X	X	X		X	X						X		X	X	X	X	X			
DGT 6104	Computer Graphics		X	X		X								X				X	X	X			
DGT 6105	Games Technology		X	X		X	X	X						X				X	X	X			
DGT 6106	Human Computer Interaction		X			X	X			X	X		X		X			X	X	X	X		
PSY 6103	Brain and Cognition		X	X												X		X	X	X			

Faculty may access the KILO map: 010 KILO KPO tables

Programme Specification Publication Dates

Revision 1	July 2022
Revision 2	May/June 2023