

## City University of Hong Kong

## Curriculum Information Record for a Major/Degree

Department of Computer Science

Effective from Semester A 2018/19

For Students Admitted/Changed to the Major with Catalogue Term  
Semester A 2018/19 and thereafter**Part I Major/Degree Overview**

**Major** (in English) : Computer Science  
(in Chinese) : 電腦科學

**Degree** (*For students admitted to the University in 2015/16 and thereafter*)  
(in English) : Bachelor of Science  
(in Chinese) : 理學士

(*For students admitted to the University in 2014/15 and before*)  
(in English) : Bachelor of Science (Honours)  
(in Chinese) : 榮譽理學士

**Award Title<sup>#</sup>** (*For students admitted to the University in 2015/16 and thereafter*)  
(in English) : Bachelor of Science in Computer Science  
(in Chinese) : 理學士 (電腦科學)

(*For students admitted to the University in 2014/15 and before*)  
(in English) : Bachelor of Science (Honours) in Computer Science  
(in Chinese) : 電腦科學榮譽理學士

*# Please make reference to the “Guidelines on Award Titles” approved by the Senate when proposing new award titles or changes to existing award titles (Senate/86/A5R).*

### 1. Normal and Maximum Period of Study

|                         | <b>Normative<br/>4-year Degree</b> | <b>Advanced<br/>Standing I<br/>(Note 1)</b> | <b>Advanced<br/>Standing II<br/>(Senior-year Entry)<br/>(Note 2)</b> |
|-------------------------|------------------------------------|---|--|
| Normal period of study  | 4 years                            | 3 years                                     | 2 years  |
| Maximum period of study | 8 years                            | 6 years                                     | 5 years  |

### 2. Minimum Number of Credit Units Required for the Award and Maximum Number of Credit Units Permitted

| <b>Degree Requirements</b>                                       | <b>Normative<br/>4-year Degree</b>             | <b>Advanced<br/>Standing I</b>                 | <b>Advanced<br/>Standing II<br/>(Senior-year<br/>Entry)</b> |
|--|--|--|---|
| Gateway Education requirement *                                  | 30 credit units                                | 21 credit units                                | 12 credit units   |
| College/School requirement *                                     | 6 credit units                                 | waived   | waived  |
| Major requirement  | 84 credit units<br>(Core: 72<br>Elective: 12 ) | 75 credit units<br>(Core: 63<br>Elective: 12 ) | 60 credit units<br>(Core: 48<br>Elective: 12 )              |
| Free electives / Minor (if applicable)                           | 0 credit unit                                  | 0 credit unit                                  | 0 credit unit   |
| <b>Minimum number of credit units<br/>required for the award</b> | <b>120 credit units</b>                        | <b>96 credit units</b>                         | <b>72 credit units</b>                                      |

|   |                         |                         |                        |
|---|-------------------------|-------------------------|------------------------|
| <b>Maximum number of credit units<br/>permitted</b> | <b>144 credit units</b> | <b>114 credit units</b> | <b>84 credit units</b> |
|---|-------------------------|-------------------------|------------------------|

\* For details, please refer to the Curriculum Information Record for Common Requirements.

### 3. Aims of Major

This major aims to provide the best possible undergraduate education with a well-balanced emphasis on computer science theories, practical hands-on development skills as well as software engineering management know-how needed to manage or work as a member of a software development team.

Through in-depth lectures and rigorous tutorials, laboratory work, projects and case studies, students will acquire a broad and thorough understanding of the theories and practical skills behind software design and development, software engineering, database systems, computer networks and information security. In addition, our study streams allow students to further specialize in different areas of expertise. The B.Sc. Computer Science includes a year long day-release industrial placement component that allows students to gain valuable real world work experience. Graduates can leverage this strong foundation to pursue technical as well as managerial positions in their career.

#### 4. Intended Learning Outcomes of Major (MILOs)

(Please state what the student is expected to be able to do on completion of the major according to a given standard of performance.)

Upon successful completion of this major, students should be able to:

| No. | MILOs   | Discovery-enriched curriculum related learning outcomes<br>(please tick where appropriate) |    |    |
|-----|---|--|----|----|
|     |   | A1   | A2 | A3 |
| 1.  | Apply relevant mathematics and engineering methods to computing.  |  |    |    |
| 2.  | Use computer programming for problem solving.   |  |    |    |
| 3.  | Identify problems, analyze requirements, formulate design and implement solutions that meet realistic constraints, such as costs, operational, social, cultural, ethical, environmental, health and safety. |  |    |    |
| 4.  | Use software engineering methods and tools for developing quality software solutions.   |  |    |    |
| 5.  | Communicate and use language effectively.   |  |    |    |
| 6.  | Develop projects effectively and independently.   |  |    |    |
| 7.  | Apply specialized knowledge in selected area(s) of Computer Science.  |  |    |    |
| 8.  | Reflect on the ethical, legal, security and social responsibilities required of professional citizens in a global society.  |  |    |    |
| 9.  | Stay abreast of contemporary issues in computing and recognize the need for, and able to engage in life-long learning.  |  |    |    |
| 10. | Collaborate and function effectively in team work situations including multi-disciplinary team.   |  |    |    |
| 11. | Function effectively in an industrial environment and apply learned skills to real-world problems.  |  |    |    |
| 12. | Acquire inquisitive attitude and skill to enable creating an original discovery or design related to computing.   | ✓  | ✓  | ✓  |

A1: Attitude

*Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.*

A2: Ability

*Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.*

A3: Accomplishments

*Demonstrate accomplishments of discovery/innovation/creativity through producing/constructing creative works/new artefacts, effective solutions to real-life problems or new processes.*

## Part II Major Requirement

(The catalogue term of the major requirement that students will follow will be the effective term of the declared/allocated major.

For normative 4-year degree students who will join the majors allocation exercise, the catalogue term of major requirement will be one year after admission.

For advanced standing students and 4-year degree students who already have a major at the time of admission, the catalogue term of major requirement will be the same as their admission term.)

### For Normative 4-year Degree (84 credit units)

#### 1. Core Courses ( 72 credit units)

##### Required CS Courses – 58 credit units

| Course Code | Course Title  | Level | Credit Units | Remarks |
|-------------|---|-------|--------------|---------|
| CS2115      | Computer Organization                               | B2    | 3            |         |
| CS2204      | Fundamentals of Internet Applications Development   | B2    | 3            |         |
| CS2310      | Computer Programming                                | B2    | 3            |         |
| CS2312      | Problem Solving and Programming                     | B2    | 3            |         |
| CS2402      | Introduction to Computational Probability Modelling | B2    | 3            |         |
| CS2611      | Seminars on Contemporary Technology I               | B2    | 1            |         |
| CS3103      | Operating Systems                                   | B3    | 3            |         |
| CS3201      | Computer Networks                                   | B3    | 3            |         |
| CS3334      | Data Structures                                     | B3    | 3            |         |
| CS3342      | Software Design                                     | B3    | 3            |         |
| CS3343      | Software Engineering Practice                       | B3    | 3            |         |
| CS3402      | Database Systems                                    | B3    | 3            |         |
| CS3504      | IT Professional Placement                           | B3    | 12           |         |
| CS4335      | Design and Analysis of Algorithms                   | B4    | 3            |         |
| CS4514      | Project   | B4    | 9            |         |

##### Required Supporting Courses – 14 credit units

|   |   |    |   |  |
|---|---|----|---|--|
| SS3904                                  | Science, Technology and Society for Computing             | B3 | 3 |  |
| MA2185                                  | Discrete Mathematics                                      | B2 | 3 |  |
| EN4262                                  | English Communication Skills for Computing                | B4 | 2 |  |
| Choose any ONE from the following list: |   |    |   |  |
| GE2313                                  | Global IT Case Studies                                    | B2 | 3 |  |
| GE2315                                  | Security and Privacy in the Information Age               | B2 | 3 |  |
| GE2323                                  | Mobile Social Networks: Practices, Challenges, and Beyond | B2 | 3 |  |
| GE2324                                  | The Art and Science of Data                               | B2 | 3 |  |
| GE2338                                  | Internet Applications and Security                        | B2 | 3 |  |
| GE2340                                  | Artificial Intelligence – Past, Present, and Future       | B2 | 3 |  |
| Choose any ONE from the following list: |   |    |   |  |
| CB2100                                  | Introduction to Financial Accounting                      | B2 | 3 |  |
| CB2300                                  | Management  | B2 | 3 |  |
| CB2500                                  | Information Management                                    | B2 | 3 |  |
| CB2601                                  | Marketing   | B2 | 3 |  |

## 2. Electives ( 12 credit units)

| <i>Electives : minimum 12 credit units from these electives</i>   |  |       |              |                       |
|---|--|-------|--------------|-----------------------|
| Students may choose any of the streams by taking <b>3</b> courses of the selected stream. For those who do not want to focus on a selected stream, they can take any <b>4</b> elective courses from the list. |  |       |              |                       |
| Course Code   | Course Title                               | Level | Credit Units | Remarks               |
| <b>Information Security Stream : Stream Core</b>  |  |       |              |                       |
| CS4286  | Internet Security and E-Commerce Protocols | B4    | 3            |                       |
| CS4293  | Topics in Cybersecurity                    | B4    | 3            |                       |
| CS4394  | Information Security and Management        | B4    | 3            |                       |
| <b>Multimedia Computing Stream : Stream Core</b>  |  |       |              |                       |
| CS3483  | Multimodal Interface Design                | B3    | 3            |                       |
| CS4182  | Computer Graphics                          | B4    | 3            |                       |
| <b>Choose <u>one</u> out of the following four courses:</b>   |  |       |              |                       |
| CS4185  | Multimedia Technologies and Applications   | B4    | 3            |                       |
| CS4186  | Computer Vision and Image Processing       | B4    | 3            |                       |
| CS4187  | Computer Vision for Interactivity          | B4    | 3            |                       |
| CS4188  | Virtual Reality                            | B4    | 3            |                       |
| <b>Software Engineering and Project Management Stream : Stream Core</b>   |  |       |              |                       |
| <b>Choose <u>three</u> out of the following four courses:</b>   |  |       |              |                       |
| CS3346  | Software Testing and Maintenance           | B3    | 3            |                       |
| CS3356  | Managing Software Projects                 | B3    | 3            | Exclusive with IS4500 |
| CS4348  | Software Quality Management                | B4    | 3            |                       |
| CS4389  | Decentralized Applications Development     | B4    | 3            |                       |
| <b>Data Science Stream: Stream Core</b>   |  |       |              |                       |
| CS3481  | Fundamentals of Data Science               | B3    | 3            |                       |
| CS4480  | Data-Intensive Computing                   | B4    | 3            |                       |
| CS4487  | Machine Learning                           | B4    | 3            |                       |
| <b>Other Electives :</b>  |  |       |              |                       |
| CS3185  | Computer Architecture                      | B3    | 3            |                       |
| CS3283  | Distributed Systems                        | B3    | 3            |                       |
| CS3382  | Web Usability Design and Engineering       | B3    | 3            |                       |
| CS3391  | Advanced Programming                       | B3    | 3            |                       |
| CS4280  | Advanced Internet Applications Development | B4    | 3            |                       |
| CS4284  | Mobile Computing                           | B4    | 3            |                       |
| CS4285  | High Speed Multimedia Networks             | B4    | 3            |                       |
| CS4288  | Cryptographic Algorithms and Protocols     | B4    | 3            |                       |
| CS4289  | Pervasive Computing                        | B4    | 3            |                       |
| CS4295  | Mobile Application Programming             | B4    | 3            |                       |
| CS4296  | Cloud Computing                            | B4    | 3            |                       |
| CS4297  | Cloud Robotics and Automation              | B4    | 3            |                       |
| CS4298  | iOS Application Development                | B4    | 3            |                       |
| CS4367  | Computer Games Design                      | B4    | 3            |                       |
| CS4381  | Advanced Software Design                   | B4    | 3            |                       |
| CS4385  | Topics in Software Engineering             | B4    | 3            |                       |
| CS4386  | AI Game Programming                        | B4    | 3            |                       |

| Course Code | Course Title                                    | Level | Credit Units | Remarks |
|-------------|---|-------|--------------|---------|
| CS4482      | Advanced Database Systems                       | B4    | 3            |         |
| CS4485      | Information Retrieval                           | B4    | 3            |         |
| CS4486      | Artificial Intelligence                         | B4    | 3            |         |
| CS4552      | Guided Study                                    | B4    | 3            |         |
| EE4940      | Digital Information Communications              | B4    | 3            |         |
| IS4501      | Information Systems Audit                       | B4    | 3            |         |
| MA2172      | Applied Statistics for Sciences and Engineering | B2    | 3            |         |

**For Advanced Standing I (75 credit units)**

**1. Core Courses ( 63 credit units)**

**Required CS Courses – 55 credit units**

| Course Code | Course Title                                      | Level | Credit Units | Remarks |
|-------------|---|-------|--------------|---------|
| CS2115      | Computer Organization                             | B2    | 3            |         |
| CS2204      | Fundamentals of Internet Applications Development | B2    | 3            |         |
| CS2310      | Computer Programming                              | B2    | 3            |         |
| CS2312      | Problem Solving and Programming                   | B2    | 3            |         |
| CS2611      | Seminars on Contemporary Technology I             | B2    | 1            |         |
| CS3103      | Operating Systems                                 | B3    | 3            |         |
| CS3201      | Computer Networks                                 | B3    | 3            |         |
| CS3334      | Data Structures                                   | B3    | 3            |         |
| CS3342      | Software Design                                   | B3    | 3            |         |
| CS3343      | Software Engineering Practice                     | B3    | 3            |         |
| CS3402      | Database Systems                                  | B3    | 3            |         |
| CS3504      | IT Professional Placement                         | B3    | 12           |         |
| CS4335      | Design and Analysis of Algorithms                 | B4    | 3            |         |
| CS4514      | Project   | B4    | 9            |         |

**Required Supporting Courses – 8 credit units**

|        |   |    |   |  |
|--------|---|----|---|--|
| SS3904 | Science, Technology and Society for Computing | B3 | 3 |  |
| MA2185 | Discrete Mathematics                          | B2 | 3 |  |
| EN4262 | English Communication Skills for Computing    | B4 | 2 |  |

## 2. Electives ( 12 credit units)

| <i>Electives : minimum 12 credit units from these electives</i>   |  |       |              |                       |
|---|--|-------|--------------|-----------------------|
| Students may choose any of the streams by taking <b>3</b> courses of the selected stream. For those who do not want to focus on a selected stream, they can take any <b>4</b> elective courses from the list. |  |       |              |                       |
| Course Code   | Course Title                               | Level | Credit Units | Remarks               |
| <b>Information Security Stream : Stream Core</b>  |  |       |              |                       |
| CS4286  | Internet Security and E-Commerce Protocols | B4    | 3            |                       |
| CS4293  | Topics in Cybersecurity                    | B4    | 3            |                       |
| CS4394  | Information Security and Management        | B4    | 3            |                       |
| <b>Multimedia Computing Stream : Stream Core</b>  |  |       |              |                       |
| CS3483  | Multimodal Interface Design                | B3    | 3            |                       |
| CS4182  | Computer Graphics                          | B4    | 3            |                       |
| <b>Choose <u>one</u> out of the following four courses:</b>   |  |       |              |                       |
| CS4185  | Multimedia Technologies and Applications   | B4    | 3            |                       |
| CS4186  | Computer Vision and Image Processing       | B4    | 3            |                       |
| CS4187  | Computer Vision for Interactivity          | B4    | 3            |                       |
| CS4188  | Virtual Reality                            | B4    | 3            |                       |
| <b>Software Engineering and Project Management Stream : Stream Core</b>   |  |       |              |                       |
| <b>Choose <u>three</u> out of the following four courses:</b>   |  |       |              |                       |
| CS3346  | Software Testing and Maintenance           | B3    | 3            |                       |
| CS3356  | Managing Software Projects                 | B3    | 3            | Exclusive with IS4500 |
| CS4348  | Software Quality Management                | B4    | 3            |                       |
| CS4389  | Decentralized Applications Development     | B4    | 3            |                       |
| <b>Data Science Stream: Stream Core</b>   |  |       |              |                       |
| CS3481  | Fundamentals of Data Science               | B3    | 3            |                       |
| CS4480  | Data-Intensive Computing                   | B4    | 3            |                       |
| CS4487  | Machine Learning                           | B4    | 3            |                       |
| <b>Other Electives :</b>  |  |       |              |                       |
| CS3185  | Computer Architecture                      | B3    | 3            |                       |
| CS3283  | Distributed Systems                        | B3    | 3            |                       |
| CS3382  | Web Usability Design and Engineering       | B3    | 3            |                       |
| CS3391  | Advanced Programming                       | B3    | 3            |                       |
| CS4280  | Advanced Internet Applications Development | B4    | 3            |                       |
| CS4284  | Mobile Computing                           | B4    | 3            |                       |
| CS4285  | High Speed Multimedia Networks             | B4    | 3            |                       |
| CS4288  | Cryptographic Algorithms and Protocols     | B4    | 3            |                       |
| CS4289  | Pervasive Computing                        | B4    | 3            |                       |
| CS4295  | Mobile Application Programming             | B4    | 3            |                       |
| CS4296  | Cloud Computing                            | B4    | 3            |                       |
| CS4297  | Cloud Robotics and Automation              | B4    | 3            |                       |
| CS4298  | iOS Application Development                | B4    | 3            |                       |
| CS4367  | Computer Games Design                      | B4    | 3            |                       |
| CS4381  | Advanced Software Design                   | B4    | 3            |                       |
| CS4385  | Topics in Software Engineering             | B4    | 3            |                       |
| CS4386  | AI Game Programming                        | B4    | 3            |                       |

| Course Code | Course Title                                    | Level | Credit Units | Remarks |
|-------------|---|-------|--------------|---------|
| CS4482      | Advanced Database Systems                       | B4    | 3            |         |
| CS4485      | Information Retrieval                           | B4    | 3            |         |
| CS4486      | Artificial Intelligence                         | B4    | 3            |         |
| CS4552      | Guided Study                                    | B4    | 3            |         |
| EE4940      | Digital Information Communications              | B4    | 3            |         |
| IS4501      | Information Systems Audit                       | B4    | 3            |         |
| MA2172      | Applied Statistics for Sciences and Engineering | B2    | 3            |         |

**For Advanced Standing II (60 credit units)**

**1. Core Courses ( 48 credit units)**

**15 credit units are waived for students admitted into Advanced Standing II including courses CS2115, CS2204, CS2310, CS3201, SS3904**

**Required CS Courses – 43 credit units**

| Course Code | Course Title                          | Level | Credit Units | Remarks |
|-------------|---------------------------------------|-------|--------------|---------|
| CS2312      | Problem Solving and Programming       | B2    | 3            |         |
| CS2611      | Seminars on Contemporary Technology I | B2    | 1            |         |
| CS3103      | Operating Systems                     | B3    | 3            |         |
| CS3334      | Data Structures                       | B3    | 3            |         |
| CS3342      | Software Design                       | B3    | 3            |         |
| CS3343      | Software Engineering Practice         | B3    | 3            |         |
| CS3402      | Database Systems                      | B3    | 3            |         |
| CS3504      | IT Professional Placement             | B3    | 12           |         |
| CS4335      | Design and Analysis of Algorithms     | B4    | 3            |         |
| CS4514      | Project                               | B4    | 9            |         |

**Required Supporting Courses – 5 credit units**

|        |  |    |   |  |
|--------|--|----|---|--|
| MA2185 | Discrete Mathematics                       | B2 | 3 |  |
| EN4262 | English Communication Skills for Computing | B4 | 2 |  |



## 2. Electives ( 12 credit units)

| <i>minimum 12 credit units from these electives</i>   |  |       |              |                       |
|---|--|-------|--------------|-----------------------|
| Students may choose any of the streams by taking <b>3</b> courses of the selected stream. For those who do not want to focus on a selected stream, they can take any <b>4</b> elective courses from the list. |  |       |              |                       |
| Course Code   | Course Title                               | Level | Credit Units | Remarks               |
| <b>Information Security Stream : Stream Core</b>  |  |       |              |                       |
| CS4286  | Internet Security and E-Commerce Protocols | B4    | 3            |                       |
| CS4293  | Topics in Cybersecurity                    | B4    | 3            |                       |
| CS4394  | Information Security and Management        | B4    | 3            |                       |
| <b>Multimedia Computing Stream : Stream Core</b>  |  |       |              |                       |
| CS3483  | Multimodal Interface Design                | B3    | 3            |                       |
| CS4182  | Computer Graphics                          | B4    | 3            |                       |
| <b>Choose <u>one</u> out of the following four courses:</b>   |  |       |              |                       |
| CS4185  | Multimedia Technologies and Applications   | B4    | 3            |                       |
| CS4186  | Computer Vision and Image Processing       | B4    | 3            |                       |
| CS4187  | Computer Vision for Interactivity          | B4    | 3            |                       |
| CS4188  | Virtual Reality                            | B4    | 3            |                       |
| <b>Software Engineering and Project Management Stream : Stream Core</b>   |  |       |              |                       |
| <b>Choose <u>three</u> out of the following four courses:</b>   |  |       |              |                       |
| CS3346  | Software Testing and Maintenance           | B3    | 3            |                       |
| CS3356  | Managing Software Projects                 | B3    | 3            | Exclusive with IS4500 |
| CS4348  | Software Quality Management                | B4    | 3            |                       |
| CS4389  | Decentralized Applications Development     | B4    | 3            |                       |
| <b>Data Science Stream: Stream Core</b>   |  |       |              |                       |
| CS3481  | Fundamentals of Data Science               | B3    | 3            |                       |
| CS4480  | Data-Intensive Computing                   | B4    | 3            |                       |
| CS4487  | Machine Learning                           | B4    | 3            |                       |
| <b>Other Electives :</b>  |  |       |              |                       |
| CS3185  | Computer Architecture                      | B3    | 3            |                       |
| CS3283  | Distributed Systems                        | B3    | 3            |                       |
| CS3382  | Web Usability Design and Engineering       | B3    | 3            |                       |
| CS3391  | Advanced Programming                       | B3    | 3            |                       |
| CS4280  | Advanced Internet Applications Development | B4    | 3            |                       |
| CS4284  | Mobile Computing                           | B4    | 3            |                       |
| CS4285  | High Speed Multimedia Networks             | B4    | 3            |                       |
| CS4288  | Cryptographic Algorithms and Protocols     | B4    | 3            |                       |
| CS4289  | Pervasive Computing                        | B4    | 3            |                       |
| CS4295  | Mobile Application Programming             | B4    | 3            |                       |
| CS4296  | Cloud Computing                            | B4    | 3            |                       |
| CS4297  | Cloud Robotics and Automation              | B4    | 3            |                       |
| CS4298  | iOS Application Development                | B4    | 3            |                       |
| CS4367  | Computer Games Design                      | B4    | 3            |                       |
| CS4381  | Advanced Software Design                   | B4    | 3            |                       |
| CS4385  | Topics in Software Engineering             | B4    | 3            |                       |
| CS4386  | AI Game Programming                        | B4    | 3            |                       |

| <b>Course Code</b> | <b>Course Title</b>                             | <b>Level</b> | <b>Credit Units</b> | <b>Remarks</b> |
|--------------------|---|--------------|---------------------|----------------|
| CS4482             | Advanced Database Systems                       | B4           | 3                   |                |
| CS4485             | Information Retrieval                           | B4           | 3                   |                |
| CS4486             | Artificial Intelligence                         | B4           | 3                   |                |
| CS4552             | Guided Study                                    | B4           | 3                   |                |
| EE4940             | Digital Information Communications              | B4           | 3                   |                |
| IS4501             | Information Systems Audit                       | B4           | 3                   |                |
| MA2172             | Applied Statistics for Sciences and Engineering | B2           | 3                   |                |

### **Part III Admission Requirements for Entry to the Major, if any**

*(Admission requirements here refers to specific requirements for students already admitted to the College/School/Department with an undeclared major. Academic units can state the prerequisites required for admission to the major.)*

To be eligible for admission, you must satisfy the General Entrance Requirements.

#### **Alternative Entry**

- Alternatively, you will be considered as meeting the programme entrance requirements if you hold a higher diploma or an associate degree in computing related discipline, or an equivalent qualification.

### **Part IV Accreditation by Professional / Statutory Bodies**

The programme is the first computer science programme in Hong Kong accredited by the Hong Kong Institution of Engineers (HKIE). Based on the Seoul Accord, graduates will receive reciprocal recognition from the equivalent bodies in Australia, Canada, Israel, New Zealand, South Africa, the UK and the US.

### **Part V Additional Information**

Nil

## Part VI Curriculum Map

(The curriculum map shows the mapping between courses and the MILOs. It should cover all courses designed specifically for the major.)

| Courses                    |  |                | M1      | M2      | M3      | M4      | M5   | M6      | M7   | M8      | M9      | M10     | M11 | M12  |      |    |
|----------------------------|--|----------------|---------|---------|---------|---------|------|---------|------|---------|---------|---------|-----|------|------|----|
| Code                       | Title  | No. of Credits |         |         |         |         |      |         |      |         |         |         |     | A1   | A2   | A3 |
| <b>Core Courses</b>        |  |                |         |         |         |         |      |         |      |         |         |         |     |      |      |    |
| <b>Required CS Courses</b> |  |                |         |         |         |         |      |         |      |         |         |         |     |      |      |    |
| CS2115                     | Computer Organization                              | 3              | T, P, M | T, P    |         |         |      |         |      |         |         |         |     | T    | T    |    |
| CS2204                     | Fundamentals of Internet Applications Development  | 3              |         | T, P, M | T, P    | T, P    |      | T       |      |         | T       |         |     | T    | T, P |    |
| CS2310                     | Computer Programming                               | 3              |         | T, P, M |         | T, P    |      |         |      |         |         |         |     | T    | T, P |    |
| CS2312                     | Problem Solving and Programming                    | 3              |         | T, P, M | T, P, M | T, P    |      |         |      |         |         |         |     | T    | T, P |    |
| CS2402                     | Introduction to Computational Probability Modeling | 3              | T, P, M |         |         |         |      |         | T, P |         | T       |         |     |      |      |    |
| CS2611                     | Seminars on Contemporary Technology I              | 1              |         |         | T, M    |         |      |         |      | T       | T, P, M |         | T   | T    | T    |    |
| CS3103                     | Operating Systems                                  | 3              | T, P    | T, P    | T, P    |         |      |         |      |         |         |         |     | T    | T, P |    |
| CS3201                     | Computer Networks                                  | 3              | T, P    |         | T, P    |         |      |         |      |         |         |         |     | T    | T, P |    |
| CS3334                     | Data Structures                                    | 3              | T, P    | T, P, M |         |         |      |         |      |         |         |         |     | T    | T, P |    |
| CS3342                     | Software Design                                    | 3              | T, P, M |         | T, P, M | T, P, M | T, P | T, P, M |      | T, P, M |         | T, P, M |     | T, P | T, P |    |

| Courses                            |   |                | M1     | M2     | M3     | M4     | M5     | M6     | M7 | M8  | M9     | M10    | M11 | M12  |      |    |
|------------------------------------|---|----------------|--------|--------|--------|--------|--------|--------|----|-----|--------|--------|-----|------|------|----|
| Code                               | Title   | No. of Credits |        |        |        |        |        |        |    |     |        |        |     | A1   | A2   | A3 |
| CS3343                             | Software Engineering Practice                 | 3              | T, P,M | T, P,M | T, P,M | T, P,M | T, P,M | T, P,M |    | T   |        | T, P,M |     | T, P | T, P | M  |
| CS3402                             | Database Systems                              | 3              | T, P   | T, P   | T, P   |        |        |        |    |     |        |        |     | T    | T, P |    |
| CS3504                             | IT Professional Placement                     | 12             |        |        | P,M    |        | P,M    | P,M    |    | P,M | M      | P,M    | P,M | T, P | T, P |    |
| CS4335                             | Design and Analysis of Algorithms             | 3              | T, P   | T, P   | T, P   |        |        |        |    |     |        |        |     | T    | T, P |    |
| CS4514                             | Project                                       | 9              | P      | P      | P,M    | P,M    | P,M    | P,M    | P  | P   | P,M    |        |     |      | P    | M  |
| <b>Required Supporting Courses</b> |   |                |        |        |        |        |        |        |    |     |        |        |     |      |      |    |
| SS3904                             | Science, Technology and Society for Computing | 3              |        |        | T,P,M  |        |        |        |    |     | T, P,M | T, P,M |     |      |      |    |
| MA2185                             | Discrete Mathematics                          | 3              | T, P,M |        |        |        |        |        |    |     |        |        |     | T    |      |    |
| EN4262                             | English Communication Skills for Computing    | 2              |        |        |        |        | T, P,M |        |    |     |        |        |     |      |      |    |

| <i>For Normative 4-year Degree</i> |   |                |    |    |    |    |    |    |    |      |    |     |     |     |    |    |
|------------------------------------|---|----------------|----|----|----|----|----|----|----|------|----|-----|-----|-----|----|----|
| Courses                            |   |                | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8   | M9 | M10 | M11 | M12 |    |    |
| Code                               | Title   | No. of Credits |    |    |    |    |    |    |    |      |    |     |     | A1  | A2 | A3 |
| GE2313                             | Global IT Case Studies                                    | 3              |    |    |    |    |    |    |    | T, P | T  |     |     |     |    |    |
| GE2315                             | Security and Privacy in the Information Age               | 3              |    |    |    |    |    |    |    | T, P | T  |     |     |     |    |    |
| GE2323                             | Mobile Social Networks: Practices, Challenges, and Beyond | 3              |    |    |    |    |    |    |    | T, P | T  |     |     |     |    |    |
| GE2324                             | The Art and Science of Data                               | 3              |    |    |    |    |    |    |    | T, P | T  |     |     |     |    |    |
| GE2338                             | Internet Applications and Security                        | 3              |    |    |    |    |    |    |    | T, P | T  |     |     |     |    |    |
| GE2340                             | Artificial Intelligence – Past, Present, and Future       | 3              |    |    |    |    |    |    |    | T, P | T  |     |     |     |    |    |
| CB2100                             | Introduction to Financial Accounting                      | 3              |    |    |    |    |    |    |    | T    |    |     |     |     |    |    |
| CB2300                             | Management  | 3              |    |    |    |    |    |    |    | T    |    |     |     |     |    |    |
| CB2500                             | Information Management                                    | 3              |    |    |    |    |    |    |    | T    |    |     |     |     |    |    |
| CB2601                             | Marketing   | 3              |    |    |    |    |    |    |    | T    |    |     |     |     |    |    |

| Electives   |  |                |      |    |         |    |    |    |         |      |         |     |     |      |      |    |
|---|--|----------------|------|----|---------|----|----|----|---------|------|---------|-----|-----|------|------|----|
| Information Security Stream : Stream Core                   |  |                |      |    |         |    |    |    |         |      |         |     |     |      |      |    |
| Courses   |  |                | M1   | M2 | M3      | M4 | M5 | M6 | M7      | M8   | M9      | M10 | M11 | M12  |      |    |
| Code  | Title                                      | No. of Credits |      |    |         |    |    |    |         |      |         |     |     | A1   | A2   | A3 |
| CS4286  | Internet Security and E-Commerce Protocols | 3              | T, P | P  | T, P, M |    |    |    | T, P, M | T, P | T, P    |     |     | T, P | T, P |    |
| CS4293  | Topics in Cybersecurity                    | 3              | T, P | P  | T, P    |    |    |    | T, P, M | T, P | T, P, M |     |     | T    | T, P |    |
| CS4394  | Information Security and Management        | 3              |      |    | T, P    |    |    |    | T, P    | T, P | T, P    |     |     | T    | T, P |    |
| Multimedia Computing Stream : Stream Core                   |  |                |      |    |         |    |    |    |         |      |         |     |     |      |      |    |
| CS3483  | Multimodal Interface Design                | 3              |      |    | T, P, M |    |    |    | T, P, M |      | T, P    |     |     | T    | T, P | M  |
| CS4182  | Computer Graphics                          | 3              | T, P | P  | T, P    |    |    |    | T, P, M |      | T, P    |     |     | T    | T, P |    |
| <i>Choose <u>one</u> out of the following four courses:</i> |  |                |      |    |         |    |    |    |         |      |         |     |     |      |      |    |
| CS4185  | Multimedia Technologies and Applications   | 3              | T, P | P  | T, P    |    |    |    | T, P    |      | T, P    |     |     | T    | T, P |    |
| CS4186  | Computer Vision and Image Processing       | 3              | T, P | P  | T, P    |    |    |    | T, P    |      | T, P    |     |     | T    | T, P |    |
| CS4187  | Computer Vision for Interactivity          | 3              | T, P | P  | T, P    |    |    |    | T, P    |      | T, P    |     |     | T    | T, P |    |
| CS4188  | Virtual Reality                            | 3              | T, P |    | T, P    |    |    |    | T, P, M |      | T, P    |     |     | T    | T, P |    |

**Software Engineering and Project Management Stream : Stream Core**

 Choose three out of the following four courses:

| Courses |  |                | M1   | M2 | M3      | M4      | M5   | M6      | M7      | M8   | M9   | M10  | M11 | M12 |      |    |
|---------|--|----------------|------|----|---------|---------|------|---------|---------|------|------|------|-----|-----|------|----|
| Code    | Title                                  | No. of Credits |      |    |         |         |      |         |         |      |      |      |     | A1  | A2   | A3 |
| CS3346  | Software Testing and Maintenance       | 3              | T, P | P  |         | T, P, M |      |         | T, P, M |      | T, P |      |     | T   | T, P |    |
| CS3356  | Managing Software Projects             | 3              | T, P |    |         | T, P    | T, P | T, P, M | T, P, M | T, P | T, P | T, P |     | T   | T    |    |
| CS4348  | Software Quality Management            | 3              | T, P |    |         | T, P    | T, P |         | T, P    | T, P | T, P | T, P |     | T   | T, P |    |
| CS4389  | Decentralized Applications Development | 3              |      | P  | T, P, M | T, P    | T, P | T, P    | T, P    |      | T, P |      |     | T   | T, P |    |

**Data Science Stream: Stream Core**

|        |                              |   |      |   |         |  |  |  |         |  |      |  |  |      |      |  |
|--------|------------------------------|---|------|---|---------|--|--|--|---------|--|------|--|--|------|------|--|
| CS3481 | Fundamentals of Data Science | 3 | T, P | P | T, P    |  |  |  | T, P, M |  | T, P |  |  | T, P | T, P |  |
| CS4480 | Data-Intensive Computing     | 3 | T, P | P | T, P, M |  |  |  | T, P, M |  | T, P |  |  | T, P | T, P |  |
| CS4487 | Machine Learning             | 3 | T, P |   | T, P    |  |  |  | T, P    |  | T, P |  |  | T    | T, P |  |

**Other Electives :**

|        |                                      |   |      |      |      |         |   |      |      |      |      |      |  |      |      |  |
|--------|--------------------------------------|---|------|------|------|---------|---|------|------|------|------|------|--|------|------|--|
| CS3185 | Computer Architecture                | 3 | T, P |      |      |         |   |      | T, P |      | T, P |      |  | T    | T, P |  |
| CS3283 | Distributed Systems                  | 3 | T, P | P    | T, P |         |   |      | T, P |      |      |      |  | T    | T, P |  |
| CS3382 | Web Usability Design and Engineering | 3 | T, P |      | T, P | T, P, M | P | P, M | T, P | T, P | T, P | T, P |  | T    | T, P |  |
| CS3391 | Advanced Programming                 | 3 |      | T, P | T, P |         |   |      | T, P |      | T, P | T, P |  | T, P | T, P |  |

| Courses |  |                | M1   | M2   | M3   | M4   | M5 | M6 | M7      | M8 | M9   | M10  | M11 |      | M12  |    |
|---------|--|----------------|------|------|------|------|----|----|---------|----|------|------|-----|------|------|----|
| Code    | Title                                      | No. of Credits |      |      |      |      |    |    |         |    |      |      |     | A1   | A2   | A3 |
| CS4280  | Advanced Internet Applications Development | 3              |      | P    | T, P | T, P |    | P  | T, P    |    | T, P | T, P |     | T, P | T, P |    |
| CS4284  | Mobile Computing                           | 3              | T, P |      | T, P |      |    |    | T, P    |    | T, P |      |     | T    | T, P |    |
| CS4285  | High Speed Multimedia Networks             | 3              | T, P |      | T, P |      |    |    | T, P    |    | T, P |      |     | T    | T, P |    |
| CS4288  | Cryptographic Algorithms and Protocols     | 3              | T, P | P    | T, P |      |    |    | T, P    |    | T, P |      |     | T    | T, P |    |
| CS4289  | Pervasive Computing                        | 3              | T, P |      | T, P |      |    |    | T, P    |    | T, P |      |     | T    | T, P |    |
| CS4295  | Mobile Application Programming             | 3              | T, P | T, P | T, P |      |    | P  | T, P, M |    | T, P |      |     | T, P | T, P | M  |
| CS4296  | Cloud Computing                            | 3              | T, P |      | T, P |      |    |    | T, P    |    | T, P |      |     | T    | T, P |    |
| CS4297  | Cloud Robotics and Automation              | 3              | T, P |      | T, P |      |    |    | T, P    |    |      |      |     | T    | T, P |    |
| CS4298  | iOS Application Development                | 3              | T, P | T, P | T, P |      |    | P  | T, P, M |    | T, P |      |     | T, P | T, P | M  |
| CS4367  | Computer Games Design                      | 3              | T, P | P    | T, P |      |    | P  | T, P    | T  |      |      |     | T, P | T, P |    |
| CS4381  | Advanced Software Design                   | 3              |      |      | T, P | T, P |    |    | T, P    |    |      |      |     | T, P | T, P |    |
| CS4385  | Topics in Software Engineering             | 3              | T, P | P    |      | T, P | -  | P  | T, P    |    | T, P | T, P |     | T    | T, P |    |
| CS4386  | AI Game Programming                        | 3              | T, P | P    | T, P |      |    | P  | T, P    |    |      |      |     | T, P | T, P |    |
| CS4482  | Advanced Database Systems                  | 3              | T, P | P    | T, P |      |    |    | T, P    |    | T, P |      |     | T    | T, P |    |



| Courses |                         |                | M1   | M2 | M3   | M4 | M5 | M6 | M7   | M8 | M9 | M10  | M11 | M12 |      |    |
|---------|-------------------------|----------------|------|----|------|----|----|----|------|----|----|------|-----|-----|------|----|
| Code    | Title                   | No. of Credits |      |    |      |    |    |    |      |    |    |      |     | A1  | A2   | A3 |
| CS4485  | Information Retrieval   | 3              | T, P | P  | T, P |    |    |    | T, P |    |    | T, P |     | T   | T, P |    |
| CS4486  | Artificial Intelligence | 3              | T, P | P  | T, P |    |    | P  | T, P |    |    | T, P |     | T   | T, P | M  |
| CS4552  | Guided Study            | 3              | P    | P  | P    |    |    | P  | P    |    |    | P, M |     |     | P    | M  |

A1: Attitude

*Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.*

A2: Ability

*Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.*

A3: Accomplishments

*Demonstrate accomplishments of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.*

T: Teach

P: Practise

M: Measure