

# SOFTWARE DESIGN – SPECIALIZATION (COMPUTING) – BACHELOR OF COMPUTING (HONOURS)

**SODE-P-BCH** (Software Design)

**SODE-I-BCH** (Software Design with Professional Internship)

**Subject:** Administered by the School of Computing

**Plan:** Consists of 108.00 units as described below.

**Program:** The Plan, with sufficient electives to total 120.00 units, will lead to a Bachelor of Computing (Honours) Degree.

Requirements for this program have been modified. Please consult the 2021-2022 (<https://www.queensu.ca/academic-calendar/archive/2021-2022/arts-science/>)*Calendar* for the previous requirements.

Code	Title	Units
<b>1. Core</b>		
<b>A. Complete the following:</b>		
CISC 121	Introduction to Computing Science I	3.00
CISC 124	Introduction to Computing Science II	3.00
<b>B. Complete 6.00 units from the following: 6.00</b>		
CISC 102	Discrete Mathematics for Computing I & MATH 112 and Introduction to Linear Algebra	
CISC 102	Discrete Mathematics for Computing I & MATH 111 and Linear Algebra	
MATH 110	Linear Algebra	
<b>C. Complete 6.00 units from the following: 6.00</b>		
MATH 120	Differential and Integral Calculus	
MATH 121	Differential and Integral Calculus	
MATH 123	Differential and Integral Calculus I & MATH 124 and Differential and Integral Calculus II	
<b>D. Complete 3.00 units from the following: 3.00</b>		
STAT 263	Introduction to Statistics	
STAT 268	Statistics and Probability I	
STAT 351	Probability I	
STAT_Options		
<b>E. Complete the following:</b>		
CISC 203	Discrete Mathematics for Computing II	3.00
CISC 204	Logic for Computing Science	3.00
CISC 220	System Level Programming	3.00
CISC 221	Computer Architecture	3.00
CISC 223	Software Specifications	3.00
CISC 235	Data Structures	3.00
<b>F. Complete the following:</b>		
CISC 324	Operating Systems	3.00

CISC 360	Programming Paradigms	3.00
CISC 365	Algorithms I	3.00
<b>G. Complete the following:</b>		
CISC 325	Human-Computer Interaction	3.00
<b>H. Complete the following:</b>		
CISC 327	Software Quality Assurance	3.00
<b>I. Complete the following:</b>		
CISC 423	Software Requirements	3.00
<b>J. Complete the following:</b>		
CISC 422	Formal Methods in Software Engineering	3.00
CISC 497	Social, Ethical and Legal Issues in Computing	3.00

<b>2. Option</b>		
<b>A. Complete 45.00 units from one of the following options:</b>		<b>45.00</b>
i. Software Development Option		
ii. Game Development Option		
<b>Electives</b>		
Elective Courses		12.00
<b>Total Units</b>		<b>120.00</b>

## Options

### i. Software Development Option

Code	Title	Units
<b>i. Software Development Option</b>		
<b>a. Complete 3.00 units from the following:</b>		<b>3.00</b>
CISC 322	Software Architecture	
CISC 326	Game Architecture	
<b>b. Complete the following:</b>		
CISC 498	Information Technology Project	6.00
<b>Applications</b>		
<b>c. Complete 3.00 units from the following course list:</b>		<b>3.00</b>
SOFT_Design at the 400-level		
<b>d. Complete 6.00 units from the following course list:</b>		<b>6.00</b>
SOFT_Design		
<b>Complementary</b>		
<b>e. Complete 3.00 units from the following:</b>		<b>3.00</b>
MECH 380	Effective Tech Communication	
PHIL 259	Critical Thinking	



WRIT 125	Fundamentals of Academic Essay Writing	
WRIT 175	Effective Writing II	
<b>f. Complete 3.00 units from the following:</b>		<b>3.00</b>
APSC 221	Economic And Business Practice	
COMM 200	Business Fundamentals	
COMM 251	Organizational Behaviour	
<b>g. Complete 3.00 units from the following course list:</b>		<b>3.00</b>
ASC_Humanities_Languages_Social_Sciences		
<b>h. Any discipline other than APSC, CISC, COCA, COGS, ELEC, MATH, MTHE, STAT</b>		<b>18.00</b>
<b>Total Units</b>		<b>45.00</b>

## ii. Game Development Option

Code	Title	Units
<b>Game Development Option</b>		
<b>a. Complete the following:</b>		
CISC 226	Game Design	3.00
CISC 271	Linear Data Analysis	3.00
<b>b. Complete 3.00 units from the following:</b>		<b>3.00</b>
CISC 322	Software Architecture	
CISC 326	Game Architecture	
<b>Applications</b>		
<b>c. Complete the following:</b>		
CISC 454	Graphics (A)	3.00
CISC 486	Game Development	3.00
<b>d. Complete the following:</b>		
CISC 496	Game Development Project	3.00
<b>Complementary</b>		
<b>e. Complete 3.00 units from the following:</b>		<b>3.00</b>
APSC 221	Economic And Business Practice	
COMM 200	Business Fundamentals	
COMM 251	Organizational Behaviour	
<b>f. Complete 3.00 units from the following:</b>		<b>3.00</b>
MECH 380	Effective Tech Communication	
PHIL 259	Critical Thinking	
WRIT 125	Fundamentals of Academic Essay Writing	
WRIT 175	Effective Writing II	
<b>g. Complete 3.00 units from the following course list:</b>		<b>3.00</b>
ASC_Humanities_Languages_Social_Sciences		
<b>h. Any discipline other than APSC, CISC, COCA, COGS, ELEC, MATH, MTHE, STAT</b>		<b>18.00</b>
<b>Total Units</b>		<b>45.00</b>

## 3. Substitutions

A. Students in the internship version of this Plan will substitute 6.00 units from COMP at the 300-level for

requirement **2.A.i.c.** (CISC 498) or 3.00 units from COMP at the 300-level for requirement **2.A.ii.d.** (CISC 496) In addition, the B.Cmp.(Hons.) Program requirements for students doing the Software Development option will be increased by 3.00 units from COMP at the 300-level, for a total of 123.00 units if the student is taking a 12-month internship, or by 6.00 units from COMP at the 300-level for a total of 126.00 units, if the student is taking a 16-month internship. For students doing the Game Development option, the B.Cmp.(Hons.) Program requirements will be increased by 6.00 units from COMP at the 300-level, for a total of 126.00 units if the student is taking a 12-month internship, or by 9.00 units from COMP at the 300-level, for a total of 129.00 units, if the student is taking a 16-month internship.

## 4. Notes

A. Students with no programming experience should review the Introductory Courses (<https://www.queensu.ca/academic-calendar/arts-science/schools-departments-programs/computing/>) paragraph included on the School of Computing overview page in the *Calendar*.

B. In exceptional circumstances (such as a student who has transferred from another Faculty or institution), the distribution requirements in the complementary courses may be relaxed, at the discretion of the Chair of Undergraduate Studies. Alternative complementary courses may be selected in consultation with the School of Computing.

C. ELEC courses are offered by the Faculty of Engineering and Applied Science. Special permission may be required to register. All such courses will count as 3.00 units towards degree requirements in Arts and Sciences.

D. Requirement **2.A.i.f.** or **2.A.ii.f.** may be satisfied by any course with a significant writing component. Alternative courses may be selected in consultation with the School of Computing.

E. The following courses are recommended as electives for students following the Game Development Option: CISC 282, CISC 320 and COCA 201.

F. With the approval of the Undergraduate Chair, students who take CISC 500 working on a project directly related to Software Design may count 3.00 units towards SOFT\_Design.

G. A maximum of 6.00 units from courses offered by other Faculties and Schools may be counted toward the program and/or Plan requirements. This includes courses in BMED, COMM, GLPH, LAW, NURS and courses in the Faculty of Engineering and Applied Science.

## Software Design Course List

The following list contains courses offered through other Departments. In accordance with Academic Regulation **2.5** (Access to Classes), students do not have enrolment priority in all of these courses. Access to these courses may only be made available during the Open Enrolment period, and then only if space permits.

### ASC\_Humanities\_Languages\_Social\_Sciences

Code	Title	Units
ANIM		
ANSH		
ARAB		
ARTF		
ARTH		
BADR (formerly BISC)		
BLCK		
CHIN		
CLST		
COCA		
CWRI		
DEVS		
DRAM		
ECON <sup>1</sup>		
EMPR		
ENGL		
ENGX		
ENIN		
ENSC <sup>2</sup>		
FILM		
FREN		
FRST		
GLPH 271	Global and Population Health	3.00
GLPH 385	Biohacking & Gerontechnology	3.00
GLPH 471	Advanced Global and Population Health	3.00
GLPH 493	Global Health Practice	3.00
GNDS		
GPHY_Human Course List*		
GREK		
GRMN		
HEBR		
HIST		
HLTH <sup>3</sup>		
IDIS		
INTS		
INUK		

ITLN

JAPN

JWST

KNPE 167	Socio-Cult Dimensions of Sport and Physical Activity	3.00
KNPE 203	Coaching and Leadership in Sport	3.00
KNPE 237	Child and Adolescent Motor Development	3.00
KNPE 254	Biomechanical Analysis of Human Movement	3.00
KNPE 265	Psychology of Sport and Exercise	3.00
KNPE 300	Community-Based Internship	3.00
KNPE 331	Care and Prevention of Athletic Injuries	3.00
KNPE 335	Healthy Aging	3.00
KNPE 336	Community Field Placement in Disability and Physical Activity	3.00
KNPE 337	Physical Activity Promotion for Children and Youth	3.00
KNPE 338	Field Course in Kinesiology and Health Studies	3.00
KNPE 345	The Science and Methodology of Sport Training Conditioning Programs	3.00
KNPE 346	Strength and Conditioning Field Placement	4.50
KNPE 363	Team Dynamics in Sport: Theory and Practice	3.00
KNPE 365	Motivational Interviewing for Physical Activity Behaviour Change	3.00
KNPE 367	Fitness, the Body and Culture	3.00
KNPE 397	Special Topics in Kinesiology	3.00
KNPE 400	Professional Issues in Allied Health	3.00
KNPE 430	Athletic Therapy Internship	4.50
KNPE 433	Global Sport and Disability	3.00
KNPE 436	Advanced Placement in Disability and Physical Activity	3.00
KNPE 446	Strength and Conditioning Internship	4.50
KNPE 463	Community-Based Physical Activity Promotion	6.00
KNPE 465	Sport Participation and Performance	3.00
KNPE 473	Sport and Culture	3.00
LANG		
LING		
LLCU		
LATN		
LIBS		
MAPP		
MOHK		
MUSC		
MUTH		



PACT
PHED
PHIL
POLS <sup>4</sup>
PORT
PPEC
PSYC 100 Principles of Psychology 6.00
PSYC 101 Principles of Psychology I 3.00
PSYC 102 Principles of Psychology II 3.00
PSYC 331 Introduction to Personality 3.00
PSYC 241 Social Psychology 3.00
PSYC 235 Abnormal Psychology 6.00
PSYC 236 Introduction to Clinical Psychology 3.00
PSYC 251 Developmental Psychology 3.00
PSYC_Clinical Course List*
PSYC_Developmental Course List*
QGSP
RELS
SOCY <sup>5</sup>
SPAN
STSC
WRIT

<sup>1</sup> **Except** ECON 250.

<sup>2</sup> **Except those courses included on ASC\_Science.**

<sup>3</sup> **Except** HLTH 230 and HLTH 331.

<sup>4</sup> **Except** POLS 285 (formerly POLS 385).

<sup>5</sup> **Except** SOCY 210 and SOCY 211.

\* **The GPHY and PSYC Course Lists noted here may be found in the** Departments/Schools and Degree Plans (<https://www.queensu.ca/academic-calendar/arts-science/schools-departments-programs/>) **section of this Calendar.**

## SOFT\_Design

Code	Title	Units
<b>Software Design Application Courses</b>		
CISC 226	Game Design	3.00
CISC 271	Linear Data Analysis	3.00
CISC 282	Fundamentals of Web Development	3.00
CISC 320	Fundamentals of Software Development	3.00
CISC 332	Database Management Systems	3.00
CISC 335	Computer Networks	3.00
CISC 340	Digital Systems	3.00
CISC 352	Artificial Intelligence	3.00
CISC 425	Advanced User Interface Design	3.00
CISC 426	Real-Time Systems	3.00

CISC 432	Advanced Data Management Systems	3.00
CISC 434	Distributed Systems	3.00
CISC 437	Performance Analysis	3.00
CISC 448	Software Reliability and Security	3.00
CISC 452	Neural and Genetic Computing	3.00
CISC 453	Topics in Artificial Intelligence	3.00
CISC 454	Graphics (A)	3.00
CISC 458	Programming Language Processors (S)	3.00
CISC 486	Game Development	3.00
ELEC 470	Computer System Architecture	3.00

## STAT\_Options

Code	Title	Units
<b>Statistic Course Options</b>		
BIOL 243	Introduction to Statistics	3.00
CHEE 209	Analysis Of Process Data	3.00
COMM 162	Managerial Statistics	3.00
ECON 250	Introduction to Statistics	3.00
GPHY 247	Introduction to Statistics	3.00
KNPE 251	Introduction to Statistics	3.00
NURS 323	Introduction to Statistics	3.00
POLS 285	Introduction to Statistics	3.00
PSYC 202	Statistics in Psychology	3.00
SOCY 211	Introduction to Statistics	3.00
STAM 200	Introduction to Statistics	3.00
STAT 263	Introduction to Statistics	3.00
STAT 367	Engineering Data Analysis	4.00