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# PhD Comprehensive-I Report

Complete this form by the end of the first month in the PhD program. Submit this form and any additional documentation to the CS Graduate Office. Please include course descriptions for courses taken at other institutions, a transcript for all courses indicated, and a plan of proposed courses if the requirement has not already been met. Courses for the breadth requirement must be completed by the end of the 4<sup>th</sup> term.

Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

Supervisor (s): \_\_\_\_\_ Date: \_\_\_\_\_

Category / Area	Course title	University	Grade
<b>Computing Technology</b>			
Software Engineering			
Programming Languages			
Hardware and Software systems			
<b>Mathematics of Computing</b>			
Algorithms and Complexity			
Scientific & Symbolic Computing			
Computational Statistics			
Quantum Information & Computation			
<b>Applications</b>			
Artificial Intelligence			
Databases			
Graphics and user interfaces			
Bioinformatics			
Health Informatics			

Senate approved June 12, 2013.

## PhD Comprehensive-I (Breadth) Requirement

The PhD Comprehensive-I (breadth) requirement ensures that a student has sufficient breadth of knowledge to undertake research at the PhD level. A student meets the requirement by taking a number of advanced courses in a broad range of categories and areas. The courses used must all have a minimum mark of B+ (or equivalent).

### Categories and Areas for Breadth Requirement

The breadth requirement divides the subject matter of computer science into three broad categories. Each category is subdivided into areas that represent a range of the fields of computer science as given in the table below. The table also indicates where computer science courses at the University of Waterloo fit in these categories and areas. A student must have at least one advanced course in six of the eleven areas, including at least one from each category (see table below).

Category	Area	UW CS Courses
Computing Technology	Software Engineering	645, 646, 647, 745, 746, 846
	Programming Languages	642, 644, 744, 747, 842
	Hardware and Software Systems	650, 651, 652, 654, [655], 656, 657, 658, 755, 758, 854, 856, 858**, 869
Mathematics of Computing	Algorithms and Complexity	662, 664, 666, 758, 761, 762, 763, 764, 765, 767, 840, 858**, 860
	Scientific and Symbolic Computing	[[670], 672, [673], 675, 676, 679, 687, 770, 774, 775, 778, 779, 780, 794, 870, 887
	Computational Statistics	680, 685, 786, 794, 885
	Quantum Information and Computation	[667], 766, 768, 867
Applications	Artificial Intelligence	679, 684, 686, 784, 785, 786, 787, 886
	Databases	[640], 648, 740, 741, 742, 743, 848, 856*
	Graphics and User Interfaces	649, 688, 781, 783, 788, 789, 791, 888, 889
	Bioinformatics	682, [683], 782, 882
	Health Informatics	792, [793]

**Note:** Versions of CS 856\* entitled "Internet-Scale Distributed Data Management" and "Web Data Management" can be used as a database course. CS 858\*\* can be used as a hardware & software course or as an algorithm course, depending on course offering.

Advanced courses taken in an undergraduate program and graduate courses can be used to meet the breadth requirement in each of the categories and areas. For example, at UW many of the 600-level graduate courses are held with 400-level fourth year courses. For the purposes of meeting the breadth requirement, the 400-level course is considered to be equivalent to the 600-level course. Although courses from other universities may not cover exactly the same material as the UW courses, they will be evaluated by the Graduate Committee to determine if the topics covered and the depth of the material is appropriate. Offerings of CS 690B, 698, 798 and 898 or equivalent may also count in an appropriate area. Courses offered by other departments may also have assigned areas.

### Procedure

Within a month of entering a PhD program, a new student submits the PhD Comprehensive-I Report to the Graduate Committee detailing their relevant past courses and future plans. The PhD Comprehensive-I Report, written in consultation with the student's supervisor, should indicate:

1. Courses or equivalent (including theses) that have already been completed by the student and which can be used to fulfill part of the breadth requirement.
2. A proposed program of study (a list of courses and the terms in which they will be taken) which the student intends to complete in order to fulfill the remaining part of the breadth requirement.

The Graduate Committee must be able to determine the content, level and mark for courses used to fulfill the requirement as compared to courses at Waterloo. The student must provide sufficient evidence to convince the committee that a course (or courses) listed does indeed fulfill an area requirement. Pertinent information includes course syllabi, textbooks used, descriptions of prerequisites or co-requisites, and calendar descriptions. The Graduate Committee will ask the student for more information or certification in cases of doubt and will consult with experts in the department as it deems appropriate. The Graduate Committee will be the final arbiter of whether courses taken and marks obtained satisfy the requirement.