Non-Major Modification Program Changes

1. Program: Neuroscience

2. Degree Designation: Specialized Honours BSc

3. Type of Modification: (Example: changes to degree / admission requirements) Adding existing and proposed BIOL, KINE and PSYC courses to the Neuroscience program as part of their 64 credit requirements.

4. Effective Date: Fall 2022

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5. State what the changes are (Example: increase / decrease to the number of major credits)

   The Neuroscience curriculum comprises 64 credits that includes six core neuroscience courses as well as existing courses clustered in three Neuroscience streams. There are currently 28 existing stream courses (offered through Biology (BIOL), Psychology (PSYC), and Kinesiology & Health Science (KINE) which students can pick from to earn a required 24 credits (8 courses).
   We want to continue to add stream courses that aligns with the neuroscience program, and expands the breadth of topics in neuroscience, while meeting the learning objectives of this program. Here we want to add two new existing courses (HH/KINE 4226 3.00, and SC/BIOL 3380 3.00) and two proposed courses (HH/PSYC 3210 3.00 and HH/KINE 4452 3.00) all of which will be offered in 2022/23 and will be part of the System Neuroscience stream.

   Our first cohort of Neuroscience students (25 in all) will be entering their third year in fall 2022 so they should be able to take these courses next year or in their fourth year as part of their 24 “stream” credits toward their degree.

   Moreover, as was the case for the 30 existing required and stream courses in the neuroscience program, additional pre-requisites need to be added to two of the four courses, so that NRSC students from any of the three entry pathways will be able to enroll in these courses, as well as have the necessary background to meet the learning objectives and outcomes of these new stream courses.

   Pre-requisites should be change as follows (changes are underlined).

   For SC/BIOL 3380 3.00, Sensory systems Prerequisites: SC/BIOL 3060 4.0 or HH/PSYC 2220 3.0 <u>or HH/SC/NRSC 2100 3.00</u>

   For HH/KINE 4226 3.00, Principles of Neurorehabilitation. Prerequisites: HH/KINE 3020 3.00 <u>or HH/SC/NRSC 2100 3.00</u>

6. Provide the rationale for the proposed changes that is rooted in the program learning outcomes.

   There are currently 13 listed learning outcomes for the neuroscience program. These

four courses contribute at least in part to these 13 outcomes and more specifically to some of the core knowledge outlined. Given the topics and approaches covered in these four courses, there is no overlap with other existing neuroscience stream courses. These courses will instead provide more breadth and choices for our NRSC students.

7. Provide an updated mapping of the program requirements to the program learning outcomes to illustrate how the proposed requirements will support the achievement of program learning objectives.

   See attached Excel spreadsheet that indicates how each of the four new courses meet the specified program learning objective and degree level expectations.

8. If relevant, summarize the consultation undertaken with relevant academic units, including commentary on the impact of the proposed changes on other programs. Provide individual statements from the relevant program(s) confirming consultation and their support.

   As the neuroscience coordinator, it is my responsibility to determine if adding new courses both aligns with and benefits the neuroscience program. I have read through the syllabuses and proposals of these four courses and conclude that each of them meet the learning objectives and outcomes of the program, as well as provide the depth and breadth that such a program should offer. The potential instructors asked me to add these courses and therefore they are open, and even eager, to including neuroscience majors in these courses.

9. Describe any resource implications and how they are being addressed (e.g., through a reallocation of existing resources). If new/additional resources are required, provide a statement from the relevant Dean(s)/Principal confirming resources will be in place to implement the changes.

   Two of these courses (HH/KINE 4226 3.00, and SC/BIOL 3380 3.00) are already being offered and the other two (HH/PSYC 3210 3.00 and HH/KINE 4452 3.00) will be offered next year to students in their respective departments. Since these courses will be added to 28 other existing stream courses (and students have to take 8 such courses), and the maximum annual intake of NRSC students is 70, it is unlikely more than 20 NRSC student will enroll in each of these courses.

10. Provide a summary of how students currently enrolled in the program will be accommodated.

    No accommodations are necessary. These courses should be in place in time for NRSC students (who are currently in their second year) to enroll next year.

11. Provide as an appendix a side-by-side comparison of the existing and proposed program requirements as they will appear in the Undergraduate or Graduate Calendar.

    THE FOUR ADDITIONAL COURSES ARE IN UNDERLINED AND IN PURPLE

Specialized Honours BSc Program in Neuroscience (120 Credits)	Specialized Honours BSc Program in Neuroscience (120 Credits)
Residency requirement: a minimum of 30 course credits and at least half (50 per cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University.	Residency requirement: a minimum of 30 course credits and at least half (50 per cent) of the course credits required in each undergraduate degree program major/minor must be taken at York University.
Qualifying Period: once admitted students will enter a qualifying period. Depending on their pathway (Biology, Kinesiology & Health Science, or Psychology) students must complete their first-year curriculum with an overall grade point average (GPA) of at least 7.50 on at least 27 earned credits at the end of first year. Successful completion of the qualifying period requirements will allow students to continue in the BSc Specialized Honour neuroscience program. Students proceeding in the program after the qualifying period are required to maintain the continuation GPA requirement.	Qualifying Period: once admitted students will enter a qualifying period. Depending on their pathway (Biology, Kinesiology & Health Science, or Psychology) students must complete their first-year curriculum with an overall grade point average (GPA) of at least 7.50 on at least 27 earned credits at the end of first year. Successful completion of the qualifying period requirements will allow students to continue in the BSc Specialized Honour neuroscience program. Students proceeding in the program after the qualifying period are required to maintain the continuation GPA requirement.
Continuation requirement: students must attain a cumulative grade point average of 6.00 (B) on 30 credits to continue in the program.	Continuation requirement: students must attain a cumulative grade point average of 6.00 (B) on 30 credits to continue in the program.
Graduation requirement: all graduates must complete a total of at least 120 credits with a minimum overall cumulative grade point average of 6.00 (B).	Graduation requirement: all graduates must complete a total of at least 120 credits with a minimum overall cumulative grade point average of 6.00 (B).
General education: a minimum of 12 credits as follows: • six credits at the 1000 level in approved Faculty of Health general education or humanities categories approved by the Faculty of Liberal Arts & Professional Studies	General education: a minimum of 12 credits as follows: • six credits at the 1000 level in approved Faculty of Health general education or humanities categories approved by the Faculty of Liberal Arts & Professional Studies

• six credits at the 1000 level in approved Faculty of Health general education or social science categories approved by the Faculty of Liberal Arts & Professional Studies Note 1: it is required that students complete the general education requirements above within their first 60 credits. Note 2: students may complete a maximum of 30 credits in general education, any additional credits not being used to fulfil general education may count toward electives. Note 3: general education requirements are satisfied by taking natural science courses, approved humanities or social science categories courses and Faculty of Health general education courses. For further information please visit yorku.ca/health/academic-resources/general-education-requirements/. Basic science requirement: a minimum of 15 credits as follows: • six credits in mathematics selected from: o SC/MATH 1013 3.00 and SC/MATH 1014 3.00 or o SC/MATH 1506 3.00 and SC/MATH 1507 3.00 • three credits selected from: o LE/EECS 1520 3.00 o LE/EECS 1540 3.00 o LE/EECS 1570 3.00 • six credits : o SC/CHEM 1000 3.00 o SC/CHEM 1001 3.00 Major credits: students must complete a minimum of 64 credits in neuroscience major. • SC/BIOL 1000 3.00 • SC/BIOL 1001 3.00 • HH/PSYC 1010 6.00	• six credits at the 1000 level in approved Faculty of Health general education or social science categories approved by the Faculty of Liberal Arts & Professional Studies Note 1: it is required that students complete the general education requirements above within their first 60 credits. Note 2: students may complete a maximum of 30 credits in general education, any additional credits not being used to fulfil general education may count toward electives. Note 3: general education requirements are satisfied by taking natural science courses, approved humanities or social science categories courses and Faculty of Health general education courses. For further information please visit yorku.ca/health/academic-resources/general-education-requirements/. Basic science requirement: a minimum of 15 credits as follows: • six credits in mathematics selected from: o SC/MATH 1013 3.00 and SC/MATH 1014 3.00 or o SC/MATH 1506 3.00 and SC/MATH 1507 3.00 • three credits selected from: o LE/EECS 1520 3.00 o LE/EECS 1540 3.00 o LE/EECS 1570 3.00 • six credits : o SC/CHEM 1000 3.00 o SC/CHEM 1001 3.00 Major credits: students must complete a minimum of 64 credits in neuroscience major. • SC/BIOL 1000 3.00 • SC/BIOL 1001 3.00 • HH/PSYC 1010 6.00

• HH/NRSC 1001 1.00 (cross-listed to: SC/NRSC 1001 1.00) • HH/NRSC 2000 3.00 (cross-listed to: SC/NRSC 2000 3.00) • HH/NRSC 2100 3.00 (cross-listed to: SC/NRSC 2100 3.00) • HH/NRSC 2200 3.00 (cross-listed to: SC/NRSC 2200 3.00) • HH/PSYC 2021 3.00 or HH/KINE 2050 3.00 • HH/NRSC 3000 3.00 (cross-listed to: SC/NRSC 3000 3.00) • HH/PSYC 3250 3.00 • HH/KINE 3650 3.00 • HH/NRSC 4000 6.00 (cross-listed to SC/NRSC 4000 6.00) or HH/NRSC 4002 6.00 (cross-listed to SC/NRSC 4002 6.00) • 12 credits selected from the list of courses in the chosen specialized stream • 12 credits selected from the list of courses in each of the two alternative specialized streams with a minimum of 3 credits required from each stream. o Molecular and Cellular Neuroscience Stream ▪ HH/KINE 3670 3.00 ▪ SC/BIOL 4310 3.00 ▪ SC/BIOL 4370 3.00 ▪ HH/KINE 4230 3.00 ▪ HH/KINE 4505 3.00 o Behavioural and Cognitive Neuroscience Stream ▪ HH/PSYC 2220 3.00 ▪ HH/PSYC 2260 3.00 ▪ HH/PSYC 3140 3.00 ▪ HH/PSYC 3265 3.00 ▪ HH/PSYC 3270 3.00 ▪ HH/PSYC 3495 3.00 ▪ HH/PSYC 4080 6.00 ▪ HH/KINE 4210 3.00 ▪ HH/PSYC 4260 3.00 ▪ HH/PSYC 4270 3.00 ▪ HH/PSYC 4360 3.00 o Systems Neuroscience Stream	• HH/NRSC 1001 1.00 (cross-listed to: SC/NRSC 1001 1.00) • HH/NRSC 2000 3.00 (cross-listed to: SC/NRSC 2000 3.00) • HH/NRSC 2100 3.00 (cross-listed to: SC/NRSC 2100 3.00) • HH/NRSC 2200 3.00 (cross-listed to: SC/NRSC 2200 3.00) • HH/PSYC 2021 3.00 or HH/KINE 2050 3.00 • HH/NRSC 3000 3.00 (cross-listed to: SC/NRSC 3000 3.00) • HH/PSYC 3250 3.00 • HH/KINE 3650 3.00 • HH/NRSC 4000 6.00 (cross-listed to SC/NRSC 4000 6.00) or HH/NRSC 4002 6.00 (cross-listed to SC/NRSC 4002 6.00) • 12 credits selected from the list of courses in the chosen specialized stream • 12 credits selected from the list of courses in each of the two alternative specialized streams with a minimum of 3 credits required from each stream. o Molecular and Cellular Neuroscience Stream ▪ HH/KINE 3670 3.00 ▪ SC/BIOL 4310 3.00 ▪ SC/BIOL 4370 3.00 ▪ HH/KINE 4230 3.00 ▪ HH/KINE 4505 3.00 o Behavioural and Cognitive Neuroscience Stream ▪ HH/PSYC 2220 3.00 ▪ HH/PSYC 2260 3.00 ▪ HH/PSYC 3140 3.00 ▪ HH/PSYC 3265 3.00 ▪ HH/PSYC 3270 3.00 ▪ HH/PSYC 3495 3.00 ▪ HH/PSYC 4080 6.00 ▪ HH/KINE 4210 3.00 ▪ HH/PSYC 4260 3.00 ▪ HH/PSYC 4270 3.00 ▪ HH/PSYC 4360 3.00 o Systems Neuroscience Stream

▪ HH/KINE 3020 3.00 ▪ SC/BIOL 4380 3.00 ▪ HH/PSYC 4215 3.00 ▪ HH/KINE 4225 3.00 ▪ HH/KINE 4240 3.00 ▪ HH/KINE 4500 3.00 ▪ HH/PSYC 4380 3.00 Upper-level credits: a minimum of 42 credits at the 3000 level or 4000 level, including 18 credits at the 3000 or 4000 level in the major with 12 credits at the 4000 level. Required science credits outside the major: A minimum of nine credits in science disciplines outside the major, of which three credits must be at the 2000-level or above. Students in the major will be deemed to have fulfilled required science credits outside the major by completing at least 12 credits in the alternative streams. Electives: additional elective credits as required for an overall total of at least 120 credits. Elective credits may be used to fulfill science and upper-level credits.	▪ HH/KINE 3020 3.00 ▪ HH/PSYC 3210 3.00 ▪ SC/BIOL 3380 3.00 ▪ HH/PSYC 4215 3.00 ▪ HH/KINE 4225 3.00 ▪ HH/KINE 4226 3.00 ▪ HH/KINE 4240 3.00 ▪ HH/PSYC 4380 3.00 ▪ HH/KINE 4452 3.00 ▪ HH/KINE 4500 3.00 ▪ SC/BIOL 4380 3.00 Upper-level credits: a minimum of 42 credits at the 3000 level or 4000 level, including 18 credits at the 3000 or 4000 level in the major with 12 credits at the 4000 level. Required science credits outside the major: A minimum of nine credits in science disciplines outside the major, of which three credits must be at the 2000-level or above. Students in the major will be deemed to have fulfilled required science credits outside the major by completing at least 12 credits in the alternative streams. Electives: additional elective credits as required for an overall total of at least 120 credits. Elective credits may be used to fulfill science and upper-level credits.

Changes in course pre-requisites for BIOL 3380 and KINE 4426

Existing Course Description	**Proposed Change And Effective Date**	**Proposed Course Description**
SC/BIOL 3380 3.00 Sensory systems The course explores sensory systems in humans, animals and machines, and how they control action, behavior and physiological state. Adopting a comparative approach, we focus on highly specialized sensory systems and unusual, often surprising solutions to sensory challenges. Prerequisite: SC/BIOL 3060 4.00 or	Change in Prerequisites starting 2022/2023	SC/BIOL 3380 3.00 Sensory systems The course explores sensory systems in humans, animals and machines, and how they control action, behavior and physiological state. Adopting a comparative approach, we focus on highly specialized sensory systems and unusual, often surprising solutions to sensory challenges. Prerequisite: SC/BIOL 3060 4.00 or

HH/PSYC 2220 3.00		HH/PSYC 2220 3.00 or HH/SC/NRSC 2100. 30.0

Existing Course Description	**Proposed Change And Effective Date**	**Proposed Course Description**
HH/KINE 4226 3.00 Principles of Neurorehabilitation The course examines principles and clinical best practices for implementation of neurorehabilitation strategies following neurologic injury. Introduces processes of neuroplasticity and repair and the use of assistive technologies to facilitate neurorehabilitation interventions for upper and lower limb motor deficits. Prerequisite: HH/KINE 3020 3.00	Change in Prerequisites starting 2022/2023	HH/KINE 4226 3.00 Principles of Neurorehabilitation The course examines principles and clinical best practices for implementation of neurorehabilitation strategies following neurologic injury. Introduces processes of neuroplasticity and repair and the use of assistive technologies to facilitate neurorehabilitation interventions for upper and lower limb motor deficits. Prerequisite: HH/KINE 3020 3.00 or HH/SC NRSC 2100. 3.00

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Note to populate this spreadsheet the proposed Neuroscience Program Level Objectives (PLOs) were mapped to the University Undergraduate Degree level expectations (UDLE) for a BSc degree. Then all the courses outliens proposed to be a part of hte new degree were revie3wed for their learning outcomes and these were mapped to the OLOs. If a course outline did not indicate learning outcomes per se, but there was inforamtion provided about teaching objectives these were reveiwed and mapped based on our best estimate, and/or the Course Instructors who taught the courses were asked for feedback on the mapping to ensure appropriate alignment of course objectives with PLO's.

After thsi first iteration, gaps were found and therefore modifications were made to the proposal adding in additional neuroscience program level objectives and a redesigning of the proposed new neuroscience courses to ensure that at least one if not more courses in the core had learning outcomes that mapped to the PLO's and UDLe's . The final product of this exercise is shown in the Excel spreadsheet.

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1) Depth and Breadth of Knowledge.																												
a) Developed knowledge and critical understanding of the key concepts, methodologies, current advances, theoretical approaches and assumptions in a discipline overall, as well as in a specialized area of a discipline;	1. Integrate and apply theoretical perspectives and major findings across broad areas of neuroscience 3. Demonstrate a detailed knowledge in one of the Specialized Neuroscience streams	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	x	x	x	X
b) Developed understanding of many of the major fields in a discipline, including, where appropriate, from an interdisciplinary perspective, and how the fields may intersect with fields in related disciplines;	2. Demonstrate knowledge of, and recognize the relationships between, the structure and function of molecules and tissues involved in neurobiological systems at all levels: molecular, cellular, and organismal. 10. Relate neuroscience to other disciplines, and apply learning from those disciplines within neuroscience e.g., mathematics, computer science, physics, health sciences, sport and society	X			X	X	X	X	x	X		X	X	X	X	X	X	X		X	X	X	X		x	x	x	X
c) Developed ability to: gather, review, evaluate and interpret information; and compare the merits of alternate hypotheses or creative options, relevant to one or more of the major fields in a discipline;	4. Locate and retrieve scientific information, and to read and critique scientific articles, demonstrate scientific writing skills, and deliver oral presentations.		x	X		X						X	X		X	X		X	x	X	X	X	X			x	x	X
d) Developed, detailed knowledge of and experience in research in an area of the discipline;	5. Perform basic laboratory techniques used in neuroscience research and understand and apply principles of laboratory safety. 6. Describe the diverse experimental research methods used in the broad areas of neuroscience and defend the use of these methods.			x		X	X				X	X	X	X	X	X		X		X	X	X	X	X		x	x	X
e) Developed critical thinking and analytical skills inside and outside the discipline; and	10. Relate neuroscience to other disciplines and apply learning from those disciplines within neuroscience. E.g. mathematics, computer science, physics , health sciences, sport and society			X		X						X	X			X		X	X	X		X				x	x	
f) Ability to apply learning from one or more areas outside the discipline.	10. Relate neuroscience to other disciplines and apply learning from those disciplines within neuroscience. E.g. mathematics, computer science, physics , health sciences, sport and society		X	X				X	X	X		X	X		X	X		X				X				x	x	
2) Knowledge of Methodologies. An understanding of methods of enquiry or creative activity, or both, in their primary area of study that enables the student to:																												
a) evaluate the appropriateness of different approaches to solving problems using well established ideas and;	5. Perform basic laboratory techniques used in neuroscience research and understand and apply principles of laboratory safety. 6. Describe the diverse experimental research methods used in the broad areas of neuroscience and defend the use of these methods				X		X			X	X				X			X		X			X				x	X

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After thsi first iteration, gaps were found and therefore modifications were made to the proposal adding in additional neuroscience program level objectives and a redesigning of the proposed new neuroscience courses to ensure that at least one if not more courses in the core had learning outcomes that mapped to the PLO's and UDLe's . The final product of this exercise is shown in the Excel spreadsheet.

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Neuroscience degree requirements		Specialization: Molecular and					Specialization: Behavioural and Cognitive Neuroscience										Specialization: Systems Neuroscience							George Mochizuki course Specialization: Systems	Niko Troje's course Specialization: Systems	Richard Murray's course Specialization: Behavioural and Cognitive Neuroscience	Heather Edgell's course Specialization: Systems
Six OCAV defined undergraduate degree level expectations (i.e., what students will need to demonstrate when degree is granted)	Defined 13 objectives/outcomes of attaining Neuroscience degree (X marks which courses map to the outcome/objective)	KINE 3670 3.00	BIOL 4310 3.00	BIOL 4370 3.00	KINE 4230 3.00	KINE 4505 3.00	PSYC 2220 3.00	PSYC 2260 3.0	PSYC 3140 3.00	PSYC 3265 3.00	PSYC 3270 3.00	PSYC 3495 3.00	PSYC 4080 6.00	KINE 4210 3.00	PSYC 4260 3.00	PSYC 4270 3.00	PSYC 4360 3.00	KINE 3020 3.00	BIOL 4380 3.00	KINE 4225 3.00	KINE 4240 3.00	KINE 4500 3.00	PSYC 4215 3.00	PSYC 4380 3.00	KINE 4226 3.00	BIOL 3380 3.00	PSYC 3210 3.00	KINE 4452 3.00
b) devise and sustain arguments or solve problems using these methods; and	7.11Develop testable research questions based upon their in-depth knowledge in one or more of the broad areas of neuroscience and apply research methods, experimental designs, and analysis techniques used to investigate such scientific questions.			x			X				X				X			x		X			X			x		
c) describe and comment upon particular aspects of current research or equivalent advanced scholarship	6. Describe the diverse experimental research methods used in the broad areas of neuroscience and defend the use of these methods. 9. Analyze and interpret pre-existing or novel data, including research findings, and communicate the findings in both oral and written formats to diverse audiences.		X	X	X			X					X		X			x		X			X				x	X
3) Application of Knowledge	1. Integrate and apply theoretical perspectives and major findings across broad areas of neuroscience, i.e., cellular and molecular, behavioural/cognitive, and systems			x	X		X	X	X		X	X	X	X	X	X			X	X	X		x			x	x	X
The ability to review, present and critically evaluate qualitative and quantitative information to: a) develop lines of argument;						X		X	X			X	X		X	X			X			X				x		X
b) make sound judgments in accordance with the major theories, concepts and methods of the subject(s) of study;	7. Develop testable research questions based upon their in-depth knowledge in one or more of the broad areas of neuroscience and apply research methods, experimental designs, and analysis techniques used to investigate such scientific questions.					X		X				X	X		X	X				X		X				x		
c) apply underlying concepts, principles, and techniques of analysis, both within and outside the discipline;	10. Relate neuroscience to other disciplines and apply learning from those disciplines within neuroscience. E.g. mathematics, computer science, physics , health sciences, sport and society		X		X	X	X				X	X			X	X		X		X		X	X		x	x	x	
d) where appropriate use this knowledge in the creative process; and	7. Develop testable research questions based upon their in-depth knowledge in one or more of the broad areas of neuroscience and apply research methods, experimental designs, and analysis techniques used to investigate such scientific questions															X							X			x		
The ability to use a range of established techniques to: i) initiate and undertake critical evaluation of arguments, assumptions, abstract concepts and information; and	4. Locate and retrieve scientific information, and to read, critique, evaluate scientific articles, demonstrate scientific writing skills and deliver oral presentations. 9. Analyze and interpret pre-existing or novel data, including research findings, to develop lines of argument, propose solutions, and communicate the findings in both oral and written formats to diverse audiences.					X		X	X			X	X		X	X		X	X		X		X			x	x	X
ii) propose solutions;																									x			

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iii) frame appropriate questions for the purpose of solving a problem;	7. Develop testable research questions based upon their in-depth knowledge in one or more of the broad areas of neuroscience and apply research methods, experimental designs, and analysis techniques used to investigate such scientific questions												X		X			X		X			X			x		
iv) solve a problem or create a new work;	7. Develop testable research questions based upon their in-depth knowledge in one or more of the broad areas of neuroscience and apply research methods, experimental designs, and analysis techniques used to investigate such scientific questions														X			X		X			X		x	x		
v) make critical use of scholarly reviews and primary sources.	4. Locate and retrieve scientific information, and to read and critique and evaluate scientific articles, demonstrate scientific writing skills and deliver oral presentations. 7. Develop testable research questions based upon their in-depth knowledge in one or more of the broad areas of neuroscience and apply research methods, experimental designs, and analysis techniques used to investigate such scientific questions		X			X		X	X			X	X		X	X		X		X		X	X			x	X
4) Communication Skills																												
The ability to communicate information, arguments, and analyses accurately and reliably, orally and in writing to a range of audiences.	4.Locate and retrieve scientific information, and to read, critique and evaluate scientific articles, demonstrate scientific writing skills, and deliver oral presentations. 8. Represent information in a quantitative format, to analyze and interpret quantitative information, including graphs and statistics. 9.Analyze and interpret preexisting or novel data, including research findings, to develop lines of argument, propose solutions, and communicate the findings in both oral and written formats to diverse audiences.		X	X		X		X	X			X	X		X	X		X	X	X		X	X		x	x	x	X
5) Awareness of limits of knowledge																												
An understanding of the limits to their own knowledge and ability, and an appreciation of the uncertainty, ambiguity and limits to knowledge and how this might influence analyses and interpretations.								X	X			X	X	X	X	X		X		X			X		x	x	x	X
6) Autonomy and Professional Capacity. Qualities and transferable skills necessary for further study, employment, community involvement and other activities requiring:																									x			
a) the exercise of initiative, personal responsibility and accountability in both personal and group contexts;	Demonstrate initiative, personal responsibility, and accountability in the laboratory and class settng.														X	X				X			X		x		x	X
b) working effectively with others;	Work effectively and collaboratively in teams.														X	X		X					X		x	x	x	X
c) decision-making in complex contexts;															X					X								

Appendix I: see separate Excel Spreadsheet

Note to populate this spreadsheet the proposed Neuroscience Program Level Objectives (PLOs) were mapped to the University Undergraduate Degree level expectations (UDLE) for a BSc degree. Then all the courses outliens proposed to be a part of hte new degree were revie3wed for their learning outcomes and these were mapped to the OLOs. If a course outline did not indicate learning outcomes per se, but there was inforamtion provided about teaching objectives these were reveiwed and mapped based on our best estimate, and/or the Course Instructors who taught the courses were asked for feedback on the mapping to ensure appropriate alignment of course objectives with PLO's.

After thsi first iteration, gaps were found and therefore modifications were made to the proposal adding in additional neuroscience program level objectives and a redesigning of the proposed new neuroscience courses to ensure that at least one if not more courses in the core had learning outcomes that mapped to the PLO's and UDLe's . The final product of this exercise is shown in the Excel spreadsheet.

Appendix I: Undergraduate Degree Level Expectations (UDLE) mapped against Program Learning Objectives (PLO) and each course in the program (Yellow = KINE courses, Grey = PSYC courses, White = BIOL and other Science courses, green = new neuroscience courses, blue represents a course taken in either BIOL, KINE, PSYC.)

Neuroscience degree requirements		Specialization: Molecular and					Specialization: Behavioural and Cognitive Neuroscience										Specialization: Systems Neuroscience							George Mochizuki course Specialization: Systems	Niko Troje's course Specialization: Systems	Richard Murray's course Specialization: Behavioural and Cognitive Neuroscience	Heather Edgell's course Specialization: Systems
Six OCAV defined undergraduate degree level expectations (i.e., what students will need to demonstrate when degree is granted)	Defined 13 objectives/outcomes of attaining Neuroscience degree (X marks which courses map to the outcome/objective)	KINE 3670 3.00	BIOL 4310 3.00	BIOL 4370 3.00	KINE 4230 3.00	KINE 4505 3.00	PSYC 2220 3.00	PSYC 2260 3.0	PSYC 3140 3.00	PSYC 3265 3.00	PSYC 3270 3.00	PSYC 3495 3.00	PSYC 4080 6.00	KINE 4210 3.00	PSYC 4260 3.00	PSYC 4270 3.00	PSYC 4360 3.00	KINE 3020 3.00	BIOL 4380 3.00	KINE 4225 3.00	KINE 4240 3.00	KINE 4500 3.00	PSYC 4215 3.00	PSYC 4380 3.00	KINE 4226 3.00	BIOL 3380 3.00	PSYC 3210 3.00	KINE 4452 3.00
d) ability to manage their own learning in changing circumstances, both within and outside the discipline and to select an appropriate program of further study; and								X	X			X	X		X	X		X									
e) behaviour consistent with academic integrity and social responsibility.	Demonstrate academic integrity, social responsibility, and respect for diversity and different points of view.																							x		x	

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New Course Proposal
Suggested Resource and Support

- For assistance with process, procedure, see OSAS Director/Manager
- For assistance with alignment with academic plans see your UPD/Chair or AD Learning, Teaching, and Academic Programs
- For assistance with course design see the Moodle course "Health Curriculum Toolkit" at https://moodle.yorku.ca/moodle/course/view.php?id=148738 (requires passport York username and password to access).
- For assistance with course design and teaching and learning activities please contact the Faculty of Health's Educational Developer, Lisa Endersby, by email at lendersb@yorku.ca or by phone at ext. 33047.
- For assistance with designing and developing experiential education activities see either one of the EE Coordinators Anda Petro and Paola Calderon-Valdivia (eehealth@yorku.ca)
- For assistance with technology-enhanced learning in the course, please contact the Faculty of Health elearning specialist Sairam Chinnam at Learning Technology Services (schinnam@yorku.ca).
- For assistance with determining resources for students see the Library and Learning Commons resources

  SPARK (Student Papers & Academic Research Kit)
  LinkedIn Learning
  Academic Research & Resources

Approval Process

- The Faculty of Health Curriculum Committee will only consider new course proposals that have been approved by the unit responsible for offering the course.
- If the proposed course is to be cross-listed, integrated, listed as a course credit exclusion with another course, or listed as a major/minor course option in an interdisciplinary program, the proposal must be accompanied by a statement from the collaborating unit signaling agreement to the proposal.

Checklist of activities to be completed:

☒ Date reviewed course proposal draft with Director/Manager of OSAS	13-Sep-21
☒ Date reviewed course proposal draft with Associate Dean, Learning and Teaching	10-Sep-21
☒ Attached draft course outline	YES
☒ Reviewed information provided on the Moodle course "Health Curriculum Toolkit" at https://moodle.yorku.ca/moodle/course/view.php?id=148738 (requires passport York username and password to access).	

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New Course Proposal Form

School/Department: Psychology

Course Rubric and Number: HH/PSYC 3210

Credit Weight: 3.00 **Effective Session:** Fall 2022

Course Title: *The official name of the course as it will appear in the Undergraduate Calendar.*

Vision science

Short Title: *Maximum 40 characters, including punctuation and spaces. The short title appears on any documents where space is limited (*transcripts *and calendar copy).*

Vision science

Brief Course Description: *For editorial consistency, verbs should be in the present tense and begin the description; e.g., rather than writing "This course will analyze..." or "This course analyzes…". instead write "Analyzes the nature and extent of...,"*

This is the official description of the course as it will appear in the Undergraduate Calendar. The course description should be carefully written to convey what the course is about. If applicable, include information regarding the language of instruction if other than English.

Provides a comprehensive introduction to the study of human vision. Addresses a range of research methods (e.g., electrophysiology, psychophysics, neuroimaging), with an emphasis on quantitative understanding and modelling of visual function. Incorporates mathematical models and computational tools throughout the course. Topics include the eye, optics, phototransduction, models of the neuron, primary visual cortex, spatial vision, colour vision, visual decision making, and current research methods.

List course(s) where applicable:

Prerequisites: six credits from SC/MATH 1013 3.0, SC/MATH 1014 3.0, SC/MATH 1025 3.0, SC/MATH 1505 6.0; LE/EECS 1540 3.0 or LE/EECS 1570 3.0; HH/PSYC 1010 6.0 with a minimum grade of C

Corequisites:

Cross-listed to:

Course Credit Exclusions*:

Integration:**

*Course credit exclusion is a formal status accorded to pairs of courses that are recognized as having sufficient overlap in content to warrant specifically excluding students from obtaining credit for both.

**Integrated courses are graduate courses integrated (taught with) 4000-level undergraduate courses

Include the following information only if the course is: limited to a specific group of students; closed to a specific group of students; and if there is any additional information necessary for students to know before enrolling (notes section). If the course includes experiential education, such as whether the students will work with a community partner and/or if it will involve going off-campus, please include this in the notes section.

Open to:

Not open to:

Notes:

Science Course: **YES** **NO**

Denotes courses in IHST, KINE or PSYC to count as science credit for BSc degree programs	☒	☐

Course Rationale:

1. What is the rationale for creating this course (e.g., fills a gap in the curriculum, addresses a trend in the content area)?

One of York's strengths is its concentration in vision research and neuroscience. With the Psychology B.Sc. and Honours B.Sc. degrees, the new undergraduate Neuroscience program, the Cognitive Science program, as well as students in related departments such as Biology and Kinesiology with interests in psychology, we have many students with excellent quantitative backgrounds who would benefit greatly from a course in vision science that draws on and strengthens their mathematical and computational skills. This course is designed to fill that need. The course takes an approach to human vision that leverages the mathematical and computational skills that students have gained in required courses, and shows how these tools are crucial for a deeper understanding of physiological and psychological processes. I believe that the course will make an important contribution to students' scientific education.

The proposed course also prepares students for independent projects and honours theses in York labs that carry out research in vision and other areas of computational neuroscience. The skills that students learn (e.g., computational modelling of neural function, mathematical modelling of colour vision) will be enormously helpful for taking on lab projects that genuinely engage with current research problems. Furthermore, the course has an experiential education component (lab tours and follow-up presentations) that brings students into contact with several laboratories, and will help them to make informed decisions about which research interests to pursue in York labs.

2. Describe how this new course aligns with the School/Dept and/or Faculty and/or University Academic Plans. For more information about these plans, contact your UPD, Department Chair, and/or the Associate Dean, Learning, Teaching, & Academic Programs.

The proposed course supports several goals of the Departmental and University Academic Plans. Here I describe how the course supports goals of the draft Departmental plan, which is guided by the University plan.

A. UAP Priority 1: 21st Century Learning; Diversifying

- Departmental goal: Develop new undergraduate courses (3000 and 4000 level) to reflect current faculty expertise.
- Departmental goal: Broaden range of research methods and paradigms in our courses.
- Although many psychology faculty members make strong use of mathematical and computational methods in their research, there is currently no HH/PSYC course that draws on the material students learn in the required math and computer science courses in the Psychology B.Sc degrees. The proposed course supports the goal of adding 3000-level courses to reflect current faculty expertise, and it also broadens the range of research methods and paradigms in our courses.

- Departmental goal: Increase experiential learning throughout our programs.
- The proposed course includes an experiential education component that gives students personal experience of York labs.

B. UAP Priority 2: Knowledge for the Future

- Departmental goal: Increase skill level with diverse research methodologies so they have something to offer faculty labs.
- The proposed course develops students' knowledge of research that uses mathematical and computational methods, which will put them in a much better position to make genuine contributions to a wide range of York labs.

- Departmental goal: Channels for linking undergraduates to faculty labs and research opportunities.
- The experiential education component of the course gives students an overview of many research labs at York, which will help them to choose labs for independent projects and honours theses.

C. UAP Priority 3: From Access to Success

- Departmental goal: Teach soft skills of academic success.
- In the experiential education component, students are coached on how to get the most out of their lab tours. They read an article from each lab in advance, and we discuss useful questions to ask during the tours.

- Departmental goal: Undergrad to grad student pipeline.
- The experiential education component will help students to choose laboratories, and the material learned in the course will make students more appealing as potential members of prospective labs.

3. How does this proposed course complement, align, or overlap with existing course offerings, particularly in terms of objectives and/or content? If overlap exists, please indicate the nature and extent of consultation which has taken place. If the course is to be cross-listed, integrated or listed as a course credit exclusion with another course, approval is required from all the relevant Faculties/units.

HH/PSYC 2220 3.0 (Sensation and perception I) is the most similar existing course, covering vision and audition. I have taught this course many times. Most students in PSYC 2220 are from B.A. programs and have limited quantitative backgrounds, so the content is quite different from the proposed course. PSYC 2220 covers a wide range of material less thoroughly, and the material cannot be taught using the deeper mathematical and computational approaches used in the proposed course.

I believe that PSYC 2220 should be neither a prerequisite nor an exclusion for the proposed new course. (a) Some students may benefit from a more gradual introduction to vision research before taking the proposed course, and furthermore PSYC 2220 does cover a wider range of topics (e.g., hearing), so it should not be an exclusion. (b) However, the proposed course will cover topics with a very different emphasis, covering a narrower range more deeply and with quantitative methods, so the limited relevant material from PSYC 2220 can be included in the new course without difficulty. I have designed the course to appeal to students who are ready for a deeper type of introduction to visual perception. Having PSYC 2220 as a prerequisite would reduce the number of students who are able to take the course, and delay the point in their degrees at which they can take the course, with no real benefit. Students have a brief introduction to sensation and perception in PSYC 1010, which will be more than sufficient.

I have consulted with Laurie Wilcox, who is currently the other frequent instructor of PSYC 2220. She agrees that any overlap between the proposed course and PSYC 2220 is not problematic, and that PSYC 2220 should be neither a prerequisite nor an exclusion.

I am separately applying to have this course included as an eligible course in the Systems Neuroscience stream of the Neuroscience B.Sc. program.

4. What is the expected enrolment in the course?

70

Course Structure:

1. **Is this course (Please select one):**

- ☐ Fully online
- ☒ Fully face to face
- ☐ Blended (i.e., one third of the face to face class time is replaced by online instruction, one third of the class time remains face to face, and the remaining third may be any combination of online and face to face delivery). More information about defining blended learning can be found in the Common Language for eLearning: http://avptl.info.yorku.ca/files/2017/03/2014-03-26-Common-Language-for-eLearning.pdf
- ☐ Other (please describe below)

2. Number of contact hours (defined in terms of hours, weeks, etc.) involved. This information is particularly important to describe for blended and online courses as it indicates whether an effective length of term is being maintained.

one-term (12 week) course; three lecture hours per week

3. a) If this course is offered in a blended format, what percentage of the course will be taught online?

   b) In absence of scheduled contact hours (face-to-face or online), please provide an indication of the estimated time students are likely to spend engaged in learning activities online required by the course.

   c) In the absence of scheduled contact hours (face-to-face or online), please describe how the course design encourages student engagement and supports students in achieving the learning outcomes.

Not applicable.

4. Indicate the planned frequency of offering and number of sections anticipated (every year, alternate years, etc.)

one section each year

5. Number of full-time faculty members in the School/Department currently competent to teach the course. List faculty members likely to teach the course in the coming year.

will likely be taught by Richard Murray; could also be taught by Doug Crawford, James Elder, Erez Freud, Laurence Harris, Peter Kohler, Jennifer Steeves, Laurie Wilcox

Course Design Information:

This section provides an opportunity to describe the course, its design, and how delivery of the course content aligns with the learning outcomes, teaching activities, and assessment methods. There is also an opportunity for describing how the course applies principles of experiential education, technology enhanced learning and universal design for learning.

- **Experiential Education** remains a top priority for York University and the Faculty of Health as it offers a range of benefits for students related to academic performance, civic engagement and employability (for more information on the benefits of EE for students and course directors, please go to: http://health.yorku.ca/experiential-education/faculty/). Note that providing and facilitating opportunities for structured, critical reflection (e.g. using iclicker/REEF polling, exit cards, journal entry) is a key component of experiential education. For examples see: https://health.yorku.ca/experiential-education/faculty/reflection/. Course directors are invited to integrate EE into their course where possible, but it is understood that some EE activities may not be feasible in every course. Refer to York's Common Language for Experiential Education for complete definitions and further details.
- The integration of tools and strategies for **technology enhanced learning** (e.g. online learning management system like Moodle, use of polling technology such as iclicker/REEF and other in class technology e.g., see https://student.computing.yorku.ca/technology-used-in-courses/) may provide useful tools for encouraging in class engagement and facilitating deeper learning.
- The Faculty of Health is committed to the **universal design for learning** principles, i.e., offering and ensuring a diverse array of opportunities for all learners to engage, learn, and demonstrate their knowledge. More information about Universal Design for Learning, as well as recommendations for accommodations and inclusive teaching, can be found at: http://udlguidelines.cast.org/binaries/content/assets/udlguidelines/udlg-v2-2/udlg_graphicorganizer_v2-2_numbers-no.pdf and on the Teaching Commons website. Therefore, when designing a course, be sure to consider
  - multiple means of engagement (How will diverse students access and participate in the learning & teaching activities?)
  - multiple means of representation (How will course content be presented in a variety of different ways to support different learning needs and preferences?)
  - multiple means of action & expression (What diverse ways will students be able to demonstrate their learning?)

Course Learning Outcomes

1. Learning outcomes provide a framework for assessment by stating what the learners will be able to demonstrate after completing the course. A succinct learning outcome specifies the tasks students are expected to be able to perform and the level of competence expected for the tasks. Course Learning Outcomes are observable, measurable goals for students and their learning.

   Examples of course learning outcomes:

- Students will be able to correctly identify the brain's major components and gross functional areas.
- Students will be able to accurately describe the factors that impact healthy aging.
- Students will be able to critically analyze an academic journal article to determine the merits and drawbacks of the published research.

To help describe learning outcomes, consider the key questions below:

What essential knowledge, skills, and attitudes etc. should students acquire?
- How sophisticated or complex (memorization, analysis, creation, etc.) is students learning to be?
- What will students be able to do or how will they demonstrate/articulate their level of learning?
- What information is needed to be collected to verify/demonstrate students' attainment of learning outcomes?
- How informative are each of these assessment tasks to understanding the student learning process?
- Are these clearly stated and communicated to students?

More information and additional resources can be found on the Teaching Commons website.

List and number the learning outcomes for the course in the section below:

Students will be able to:
1. Describe the anatomical organization and basic functions of the human visual system.
2. Use mathematical and computational models to explain and analyze key properties of the eye and visual cortex.
3. Use mathematical and computational models to explain and analyze psychological processes such as colour perception and decision making.
4. Analyze and evaluate the strengths and limitations of several contemporary research methods in vision science.

Course Learning Objectives

1. Course learning objectives are broad goals for the course.

Examples of Course Learning objectives:
- Exposes students to the various methods used for investigating the structure and function of the human brain.
- Provides students the opportunity to develop and practice skills in effective communication.

List the learning objectives for the course below:

- Teaches fundamental facts about the human visual system (anatomy, function)
- Shows how quantitative methods can be used to describe and explain physiological and psychological phenomena
- Provides an opportunity to apply and further develop skills in mathematics and computer science learned in previous courses
- Exposes students to current topics and methods in computational neuroscience
- Teaches students to reflect on and communicate their evaluation of research methods and findings

Course Topics/Theories

2. List the key topic areas taught in this course.

visual anatomy and physiology (the eye, retinostriate pathway, visual cortex); optics; spatial vision; colour vision; decision making; experimental methods (electrophysiology, psychophysics, neuroimaging); mathematical and computational models

Course Learning and Teaching Activities

3. What teaching strategies and learning activities (including experiential education) will take place as part of this course? What will students be doing each week in class? How will these activities help support students' learning as defined by the learning outcomes.

To help identify course learning activities that will help students work toward achieving intended learning outcomes, reflect on these key questions:
- How will students receive or gain the information necessary for achieving the course intended learning outcomes?
- What experiential education activities will students engage in?
- What opportunities will or could students be provided to practice the skills they will develop?

- How and when will students engage with each other, with the instructor, and/or with course content?
- If technology-enhanced learning is incorporated into the course, what activities will the students engage in?

Examples:
(This is not an exhaustive list, but rather a summary of the strategies an instructor may use to encourage and facilitate meaningful learning throughout the course)

- In class discussions
- Lecture
- Online discussion forums (e.g. in Moodle)
- Active learning strategies (e.g. think, pair, share; structured debates)
- Wikis (contribute to and curate collaborative content)
- Experiential Education (EE)- Classroom Focused Activities (e.g. guest speakers, role playing, visual media, case studies, simulations, workshops and laboratory, course-based research, etc.)
- EE- Community Focused EE Activities (e.g. community-based learning; community-based research, community service learning)

List the teaching and learning activities that will be included in this course:

For each activity, please i) identify the learning outcome it will help the students achieve and ii) if the activity will include a formal, graded assessment of student learning. For EE activities, also identify iii) how you will engage students in reflection around the activity (i.e. critically examining the experience), and iv) the type of EE strategy the activity corresponds to.

			For EE Activities Only	
Teaching and Learning Activity	**Which course learning outcome/s will help student achieve?**	**Will this activity include a formal, graded assessment of student learning? (Y/N)** *A detailed description of assessment and evaluation strategies will be provided in the next section.*	**How you will engage students in reflection around this activity?**	**Corresponding EE Strategy** **1-** Classroom Focused **2-** Community Focused **3-** Work Focused
Example: *1. Guest Speaker representing a community-focused agency*	*Example: Identify and critically evaluate challenges to implementing equity-informed health policies* *OR* *Learning Outcome #3*	*Example:* *N*	*Example: Think-Pair-Share- In pairs, students will discuss two key questions, and share responses with the class.*	1
lectures	1, 2, 3, 4	Y		
in-class discussions	2, 3, 4	N		
problems solved at home	2, 3, 4	Y		
tours of three York vision labs chosen from six different research areas	4	Y	prepare by reading article from lab to be toured; follow up with presentation to class	1

4. If the course will not include any type of experiential education, please comment below on the rationale for not incorporating experiential education into the course.

This course will include experiential education. Students will tour vision-related labs at York University and give an in-class group presentation on their experience. I have consulted with Anda Petro, one of the Experiential Education Coordinators in the Faculty of Health, for strategies on helping students to benefit from this component of the course.

Learning/Teaching with Technology

5. How are learning or teaching technologies incorporated into the course

Throughout the course, students will be assigned computational problems to be solved in the Computing Commons, at other computing centres at York, or at home.

6. If the course does not include any type of technology enhanced learning, please comment below on the rationale for not incorporating learning or teaching technologies in the course.

This course will include technology enhanced learning.

7. If the proposed course employs technology-enhanced forms of delivery (e.g., replacing in-class time with online learning activities), please identify how the integrity of the learning evaluation will be maintained (e.g., using online quizzes that randomly selects questions from a test-bank; specified time length of the test, "on-site" examinations will be required, etc.)

The computer-based assignments will be completed outside lecture hours. Students will be encouraged to collaborate on solving problems, but will be required to submit their own solutions. Teaching assistants will monitor assignments for plagiarism; automated tools may be useful as well. I have experience dealing with these issues from teaching a graduate course on computer programming for many years, where assignments are also completed outside class time (with encouragement to work together) and then submitted.

Assessment and Evaluation Strategies

1. How will student learning be assessed? Please list each graded component of the proposed course including the type and percentage value of each component. Indicate which learning outcome(s) are evaluated by which assessment component.

Assessment Strategy	Percentage (%) of Final Grade	Evaluated Learning Outcome(s)
Example: Final Exam	40%	1, 2
Example: In Class Quizzes	4/10% each	1
Example: Teaching & Learning Activity #1 (Reflection) (1%)	1%	3

term test 1	25%	1, 2, 3, 4
term test 2	25%	1, 2, 3, 4
final exam	30%	1, 2, 3, 4
weekly quizzes	9%	1
problem sets	9%	2, 3
student presentation (groups of five)	2%	4

2. Formative feedback is just in time feedback to the students during the course that does not count toward the final grade. This formative feedback can help the students and instructor progress towards the intended learning outcomes by providing ongoing, low stakes feedback at key points in a lesson or at milestones toward completing a major assignment.

Some examples of formative feedback include:

- a pre-test or quiz that asks students to share what they already know about a topic
- a think-pair-share exercise where students explore and discuss key course concepts individually, in pairs, and as part of a larger in class discussion
- exit cards following a lecture or lesson where students are asked to indicate what they have learned and questions they still have about the topic

List the formative assessment strategies that will be used in this course below.

Not applicable.

3. If the course is to be integrated (i.e., graduate/undergraduate), please list the additional evaluation requirements for graduate students.

Not applicable.

Bibliography:

1. Please list the required readings for the course (include ebooks, online readings, and open access resources). The reading list must contain complete bibliographical information (full name of author, title, year of publication, etc.).

The following readings will be collected in a course kit.

Adelson, E. H. (2000). Lightness perception and lightness illusions. In M. Gazzaniga (Ed)., The New Cognitive Neurosciences, pp. 339–51. Cambridge, MA: MIT Press.

Blakeslee, B., & McCourt, M. E. (1999). A multiscale spatial filtering account of the White effect, simultaneous brightness contrast and grating induction. Vision Research, 39, 4361-4377.

Davidovits, P. (2013). Physics in biology and medicine, fourth edition. Waltham, MA: Academic Press. Chapter 17.

Dayan, P., & Abbott, L. F. (2001). Theoretical neuroscience. Cambridge, MA: MIT Press. Chapters 1 and 2.

DeValois, R. L., & DeValois, K. (1990). Spatial vision. Oxford University Press. Chapters 5 and 6.

Gescheider, G. A. (1997). Psychophysics: the fundamentals, third edition. Psychology Press. Chapter 5.

Grill-Spector, K., & Malach, R. (2004). The human visual cortex. Annual Review of Neuroscience, 27, 649-677.

Kandel, E. R. et al. (2021). Principles of neural science, sixth edition. McGraw-Hill Medical. Chapter 11.

Land, M. F., & Nilsson, D.-E. (2012). Animal eyes. Oxford University Press. Chapters 3 and 5.

Nicholls, J. G., et al. (2012). From neuron to brain, fifth edition. Sunderland, MA: Sinauer Associates, Inc. Chapter 3.

Rodieck, R. W. (1998). The first steps in seeing. Sunderland, MA: Sinauer Associates, Inc. Chapter 3.

Wandell, B. A. (1995). Foundations of vision. Sunderland, MA: Sinauer Associates, Inc. Chapter 9.

Wickens, T. D. (2001). Elementary signal detection theory. Oxford University Press. Chapters 1, 2, and 3.

Wolfe, J. M. et al. (2021). Sensation and perception, sixth edition. Oxford University Press. Chapters 2, 3, and 5.

2. Please list any suggested readings for the course (include ebook, online readings, and open access resources). The reading list must contain complete bibliographical information (full name of author, title, year of publication, etc.)

I will not assign suggested readings, as I prefer to focus closely on a limited amount of essential material. However, I will refer more informally to additional reading material throughout the course for students who wish to learn more.

3. If the course is to be integrated (graduate/undergraduate), a list of the additional readings required of graduate students must be included. If no additional readings are required, a rationale should be provided.

This is not an integrated course.

Other Required Resources:

1. Please provide a statement regarding the adequacy of physical resources (equipment, space, etc.). Approval of a new course will be considered only if adequate physical resources are available to support the course.

Students will carry out some assignments in locations such as the Computing Commons. I have written to Learning Technology Services requesting an evaluation and statement of support. They have not yet replied, but the course does not require substantial physical resources, and I do not anticipate any difficulties.

2. Please list any online teaching and/or learning resources (educational software) that are required for the course. If any is required, please describe what the cost will be for students.

No special resources are required.

YORK UNIVERSITY LIBRARIES

Scott Research and Collections

310 Scott Library
4700 Keele St.
Toronto ON
Canada M3J 1P3
Tel 416 736 2100
Ext. 20073
Fax 416 736 5920
www.library.yorku.ca/

Memo

To: Professor Richard Murray, Department of Psychology

From: Thumeka Mgwigwi, Teaching and Learning Librarian

Date: 10 September 2021

Subject: Library Support Statement for PSYC3210 Vision Science

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I have reviewed the course proposal material for *Vision Science.* I am happy to report that York University Libraries will be able to support this course. All of the titles in the bibliography are already held at York in print and in some cases electronic format as well. A quick search of the York Libraries resources revealed more sources related vision science and that includes both journals and monographs in print and electronic format.

For further research, students can use the online catalogue and periodical indexes like MedLine, PsycInfo, Web of Science, to name a few. More resources can be found on the following research guides:

Neuroscience
https://researchguides.library.yorku.ca/neuroscience

Psychology
https://researchguides.library.yorku.ca/psychology

Students also have access to the Resource Sharing Department to request materials not held at York Libraries.

New Course Proposal Form

School/Department: Kinesiology and Health Science

Course Rubric and Number: KINE 4452

Credit Weight: 3.00 **Effective Session:** Fall 2022

Course Title: *The official name of the course as it will appear in the Undergraduate Calendar.*

Autonomic function in health and disease

Short Title: *Maximum 40 characters, including punctuation and spaces. The short title appears on any documents where space is limited (transcripts and calendar copy).*

Autonomic function in health and disease

Brief Course Description: *For editorial consistency, verbs should be in the present tense and begin the description; e.g., "Analyzes the nature and extent of...,"*

This is the official description of the course as it will appear in the Undergraduate Calendar. The course description should be carefully written to convey what the course is about. If applicable, include information regarding the language of instruction if other than English.

Introduces the autonomic nervous system including central and peripheral aspects i.e. brain regions, parasympathetic system, and sympathetic system. Explores methodologies for measuring parasympathetic and sympathetic activity in both experimental and clinical settings. Analyzes/Examines the role of the autonomic nervous system in various clinical conditions including postural orthostatic tachycardia syndrome (POTS), heart failure, and diabetes.

List course(s) where applicable:

Prerequisites: HH/KINE 2011 3.00 and HH/KINE 3012 3.00 or permission by course director

Corequisites:

Cross-listed to:

Course Credit Exclusions*:

Integration:** HH/KAHS 6480 3.00

*Course credit exclusion is a formal status accorded to pairs of courses that are recognized as having sufficient overlap in content to warrant specifically excluding students from obtaining credit for both.

**Integrated courses are graduate courses integrated (taught with) 4000-level undergraduate courses

Include the following information only if the course is: limited to a specific group of students; closed to a specific group of students; and if there is any additional information necessary for students to know before enrolling (notes section). If the course includes experiential education, such as whether the students will work with a community partner and/or if it will involve going off-campus, please include this in the notes section.

Open to:

Not open to:

Notes:

Science Course:	**YES**	**NO**
Denotes courses in IHST, KINE or PSYC to count as science credit for BSc degree programs	☒	☐

Section A - Course Rationale:

1. What is the rationale for creating this course (e.g., fills a gap in the curriculum, addresses a trend in the content area)?

There is a current gap in the curriculum for the undergraduate Neuroscience program. The current program does not include any information concerning the autonomic nervous system even though this is a fundamental part of Neuroscience. This course will be offered as an optional course for program students. Dr. Denise Henriques (director of the graduate diploma and undergraduate neuroscience programs) is supportive of this course. It has been taught to graduate students as KAHS 6480 previously and this proposal is to create a 4th year course to be integrated with KAHS 6480.

2. Describe how this new course aligns with the School/Dept and/or Faculty and/or University Academic Plans. For more information about these plans, contact your UPD, Department Chair, and/or the Associate Dean, Learning, Teaching, & Academic Programs.

This course will support the undergraduate Neuroscience program. It will also expand experiential education and eLearning within the Faculty.

3. How does this proposed course complement, align, or overlap with existing course offerings, particularly in terms of objectives and/or content? If overlap exists, please indicate the nature and extent of consultation which has taken place. If the course is to be cross-listed, integrated or listed as a course credit exclusion with another course, approval is required from all the relevant Faculties/units.

This course will be integrated between KINE and KAHS. Approval from both the undergraduate and graduate executive committees in the School of Kinesiology and Health Sciences will be obtained. This course is currently offered as KAHS 6480.

4. What is the expected enrolment in the course? If course enrollments are below 50 please explain why.

50

Section B - Course Structure:

1. **Is this course (Please select one):**

- ☐ Fully online
- ☐ Fully face to face
- ☒ Blended (i.e., one third of the face to face class time is replaced by online instruction, one third of the class time remains face to face, and the remaining third may be any combination of online and face to face delivery). More information about defining blended learning can be found in the Common Language for eLearning: http://avptl.info.yorku.ca/files/2017/03/2014-03-26-Common-Language-for-eLearning.pdf
- ☐ Other (please describe below)

2. Number of contact hours (defined in terms of hours, weeks, etc.) involved. This information is particularly important to describe for blended and online courses as it indicates whether an effective length of term is being maintained.

Approximately 1.5 hours/week of the student's learning time will be face-to-face and 1.5 hours/week will be online. Face-to-face time will focus on discussion of posted research/review articles, group presentations, lecture review, and labs. Online time will focus on lectures and quizzes.

3. a) If this course is offered in a blended format, what percentage of the course will be taught online? If not blended, go to #4.

b) In absence of scheduled contact hours (face-to-face or online), please provide an indication of the estimated time students are likely to spend engaged in learning activities online required by the course.

c) In the absence of scheduled contact hours (face-to-face or online), please describe how the course design encourages student engagement and supports students in achieving the learning outcomes.

Approximately 50% of the course will be taught online. Half of the course will be face-to-face and students will be able to engage with the instructor and each other during this time. In person activities will include lecture review, group discussions, group presentations, and labs.

4. Indicate the planned frequency of offering and number of sections anticipated (every year, alternate years, etc.)

Once a year in the fall or winter.

5. Can you staff this course using current teaching capacity?	YES

If no, explain how this course will be resourced (e.g., additional hires proposed in hiring plan. etc.)

6. Please name the faculty members(s) in the school/department who have the expertise and are willing to teach this course.

Heather Edgell

7. Does the course rely on faculty from other programs to teach this course? If so, specify (proposed instructor(s) name and department and attach a letter of support from the faculty members home school/department UPD/Chair.

No.

Section C - Course Design Information:

This section provides an opportunity to describe the course, its design, and how delivery of the course content aligns with the learning outcomes, teaching activities, and assessment methods. There is also an opportunity for describing how the course applies principles of experiential education, technology enhanced learning and universal design for learning.

- **Experiential Education** remains a top priority for York University and the Faculty of Health as it offers a range of benefits for students related to academic performance, civic engagement and employability. Note that providing and facilitating opportunities for structured, critical reflection (e.g. using iclicker/REEF polling, exit cards, journal entry) is a key component of experiential education. Course directors are invited to integrate EE into their course where possible, but it is understood that some EE activities may not be feasible in every course. Go to https://health.yorku.ca/experiential-education/faculty/ to see definitions of course focused, community focused, and work focused EE, information on the benefits of EE for students and course directors, and other details.
- The integration of tools and strategies for **technology enhanced learning** (e.g. online learning management system like Moodle, use of polling technology such as iclicker/REEF and other in class technology e.g., see https://student.computing.yorku.ca/technology-used-in-courses/) may provide useful tools for encouraging in class engagement and facilitating deeper learning. For help with online and blended learning course development go to https://lts.info.yorku.ca/heath/.
- The Faculty of Health is committed to the **universal design for learning** principles, i.e., offering and ensuring a diverse array of opportunities for all learners to engage, learn, and demonstrate their knowledge. More information about Universal Design for Learning, as well as recommendations for accommodations and inclusive teaching, can be found at: http://udlguidelines.cast.org/binaries/content/assets/udlguidelines/udlg-v2-2/udlg_graphicorganizer_v2-2_numbers-no.pdf and on the Teaching Commons website. Therefore, when designing a course, be sure to consider
    - multiple means of engagement (How will diverse students access and participate in the learning & teaching activities?)
    - multiple means of representation (How will course content be presented in a variety of different ways to support different learning needs and preferences?)
    - multiple means of action & expression (What diverse ways will students be able to demonstrate their

learning?)

1. Course Topics/Theories

List the key topic areas taught in this course.

This course will focus on the anatomy and physiology of the central and peripheral autonomic nervous system, and on the methodologies used to measure autonomic function in research and clinical settings. Students will learn about autonomic reflexes that are active during upright posture or exercise such as the chemoreflexes, metaboreflex, mechanoreflex and baroreflex. Students will learn about autonomic control of the cardiovascular and respiratory systems, gastrointestinal control and temperature control. Topics will cover healthy responses to stimuli as well as various autonomic disorders such as Diabetes, Postural Orthostatic Tachycardia Syndrome, Heart Failure, Chronic Obstructive Pulmonary Disease, Concussion, Sleep apnea (not exclusively).

Will the course have substantial Indigenous (Aboriginal)* content?	NO
Will the course include Indigenous (Aboriginal)* identity as either a module or field of study?	NO
Will the course include component(s) from Aboriginal Peoples' language, history, cultural, heritage, artefacts, or traditional knowledge?	NO

*The Constitution Act, 1982, section 35(2) defines Aboriginal Peoples to include all Indigenous people of Canada - Indians (Status, Non-Status or First Nations identified), Métis and Inuit people.

If you answered Yes to at least one of the questions above, provide a summary and/or list of the Indigenous (Aboriginal)* content or components you are proposing to include in your course.

N/A

Course Teaching Objectives

Course teaching objectives are broad goals for the course.

Examples of course tearning objectives:

- Exposes students to the various methods used for investigating the structure and function of the human brain.
- Provides students the opportunity to develop and practice skills in effective communication.

List the teaching objectives for the course below:

Introduces students to the autonomic nervous system including central and peripheral aspects (i.e., brain regions, parasympathetic system, and sympathetic system).

Exposes students to methodologies for measuring parasympathetic and sympathetic activity in both experimental and clinical settings.

Invites students to discuss the role of the autonomic nervous system in various clinical conditions including postural orthostatic tachycardia syndrome (POTS), heart failure, and diabetes.

Exposes students to information pertaining to the autonomic nervous system.

Provides the opportunity to develop discussion, communication, and presentation skills.

Provides learners with the opportunity to analyze collected data.

3. Course Student Learning Outcomes:

Learning outcomes provide a framework for assessment by stating what the learners will be able to demonstrate after completing the course. A succinct learning outcome specifies the tasks students are expected to be able to perform and the level of competence expected for the tasks. Course Learning Outcomes are observable, measurable goals for students and their learning.

Examples of course learning outcomes:

- Students will be able to correctly identify the brain's major components and gross functional areas.
- Students will be able to accurately describe the factors that impact healthy aging.
- Students will be able to critically analyze an academic journal article to determine the merits and drawbacks of the published research.

To help describe learning outcomes, consider the key questions below:

What essential knowledge, skills, and attitudes etc. should students acquire?

- How sophisticated or complex (memorization, analysis, creation, etc.) is students learning to be?
- What will students be able to do or how will they demonstrate/articulate their level of learning?
- What information is needed to be collected to verify/demonstrate students' attainment of learning outcomes?
- How informative are each of these assessment tasks to understanding the student learning process?
- Are these clearly stated and communicated to students?

More information and additional resources can be found on the Teaching Commons website.

List and number the learning outcomes for the course in the section below:

After completing this course, students will be able to:
1. Utilize correct terminology to accurately describe the autonomic nervous system in health and chronic disease
2. Describe and explain the techniques used to assess the function of the autonomic nervous system
3. Accurately discuss the dysfunction of the autonomic nervous system in a variety of chronic clinical conditions
4. Critically analyse relevant scientific articles related to lectures and group presentations
5. Demonstrate teamwork skills by organizing and presenting on a topic concerning autonomic dysfunction in teams
6. Analyse cardiorespiratory laboratory data in a manner which is clinically applicable

4. Course Teaching Strategies and Learning Activities

1. What teaching strategies and learning activities (including experiential education) will take place as part of this course? What will students be doing each week in class? How will these activities help support students' learning as defined by the learning outcomes.

To help identify course learning activities that will help students work toward achieving intended learning outcomes, reflect on these key questions:

- How will students receive or gain the information necessary for achieving the course intended learning outcomes?
- What experiential education activities will students engage in?
- What opportunities will or could students be provided to practice the skills they will develop?
- How and when will students engage with each other, with the instructor, and/or with course content?
- If technology-enhanced learning is incorporated into the course, what activities will the students engage in?

Examples:
(This is not an exhaustive list, but rather a summary of the strategies an instructor may use to encourage and facilitate meaningful learning throughout the course)

- In class discussions

- Lecture
- Online discussion forums (e.g. in Moodle)
- Active learning strategies (e.g. think, pair, share; structured debates)
- Wikis (contribute to and curate collaborative content)
- Experiential Education (EE)- Classroom Focused Activities (e.g. guest speakers, role playing, visual media, case studies, simulations, workshops and laboratory, course-based research, etc.)
- EE- Community Focused EE Activities (e.g. community-based learning; community-based research, community service learning)
- EE- Work Focused Activities (e.g. placement/practicum)

List the teaching strategies and learning activities that will be included in this course:

Laboratory demonstration and data analysis Synchronous and asynchronous presentation of material (lecture format) In class discussion of lectures and readings in groups and individually Online quizzes

Section D - Course Mapping and Constructive Alignment

This section is designed to help you demonstrate the connections between your learning outcomes, teaching and learning activities, and assessment strategies. For each teaching and learning activity, please i) identify the learning outcome it will help the students achieve and ii) if the activity will include a formal, graded assessment of student learning. For EE activities, also identify iii) how you will engage students in reflection around the activity (i.e. critically examining the experience), and iv) the type of EE strategy the activity corresponds to.

			For EE Activities Only	
Teaching and Learning Activity	**Which course learning outcome/s will this activity help student achieve?**	**Will this activity include a formal, graded assessment of student learning? (Y/N)** *A detailed description of assessment and evaluation strategies will be provided in the next section.*	**How you will engage students in reflection around this activity?**	**Corresponding EE Strategy** **1-** Classroom Focused **2-** Community Focused **3-** Work Focused
Example: *1. Guest Speaker representing a community-focused agency*	*Example: Identify and critically evaluate challenges to implementing equity-informed health policies* *OR* *Learning Outcome #3*	*Example:* *N*	*Example: Think-Pair-Share- In pairs, students will discuss two key questions, and share responses with the class.*	1
In-class discussion of readings and lectures	Learning Outcomes #1, 2, 3, 4	Y	iClicker questions presented in class and eClass quizzes after class will assess these discussions	1
Synchronous and asynchronous presentation of material (lecture format)	Learning Outcomes #1, 2, 3	Y	Midterm and final exams will assess this knowledge	1

Laboratory demonstration and data analysis	Learning Outcomes #1, 2, 3, 6	Y	A data analysis assignment from the collected data will be completed	1
In-class presentations	Learning Outcomes #1, 2, 3, 4, 5	Y	Undergraduate students will conduct group presentations and graduate students will conduct an individual presentation	1

1. If the course will not include any type of experiential education, please comment below on the rationale for not incorporating experiential education into the course.

N/A

2. Will the course engage Indigenous (Aboriginal) communities (including reserves, territories, departments, or community organizations, etc) on experiential education?

NO

Learning/Teaching with Technology:

3. How are learning or teaching technologies incorporated into the course?

The course will utilize an eClass site as the "home base" for all lectures, course materials and connections. Students who have access to devices in class may use them for in-class quizzes, however students are also able to participate without a device. State of the art laboratory equipment (Dr. Edgell's lab) will be used to demonstrate clinical autonomic testing.

4. If the course does not include any type of technology enhanced learning, please comment below on the rationale for not incorporating learning or teaching technologies in the course.

N/A

5. If the proposed course employs technology-enhanced forms of delivery (e.g., replacing in-class time with online learning activities), please identify how the integrity of the learning evaluation will be maintained (e.g., using online quizzes that randomly selects questions from a test-bank; specified time length of the test, “on-site” examinations will be required, etc.)

Online quizzes will utilize a large question bank with randomization to ensure no two tests are the same. Quizzes will have a time limit to allow ample time for completion, but will not provide enough time for students to look up all answers or communicate with other students. Course exams will still be held in-person.

Assessment and Evaluation Strategies

1. How will student learning be assessed? Please list each graded component of the proposed course including the type and percentage value of each component. Indicate which learning outcome(s) are evaluated by which assessment component.

Assessment Strategy	Percentage (%) of Final Grade	Evaluated Learning Outcome(s)
Example: Final Exam	40%	1, 2
Example: In Class Quizzes	4/10% each	1
Example: Teaching & Learning Activity #1 (Reflection) (1%)	1%	3

iClicker and eClass quizzes	5%	1,4
Presentation (group)	10%	1,2,3,4,5
Midterm x 2, Final exam	30% each midterm, 20% final	1,2,3,4
Data analysis assignment	5%	6
Graduate students:		
iClicker and eClass quizzes	5%	1,4
Presentation (individual)	10%	1,2,3,4,5
Midterm x 2, Final exam	22% each midterm, 12% final	1,2,3,4
Data analysis assignment	5%	6
Term paper	24%	1,2,3,4

2. Formative feedback is just in time feedback to the students during the course that does not count toward the final grade. This formative feedback can help the students and instructor progress towards the intended learning outcomes by providing ongoing, low stakes feedback at key points in a lesson or at milestones toward completing a major assignment.

Some examples of formative feedback include:

- a pre-test or quiz that asks students to share what they already know about a topic
- a think-pair-share exercise where students explore and discuss key course concepts individually, in pairs, and as part of a larger in class discussion
- exit cards following a lecture or lesson where students are asked to indicate what they have learned and questions they still have about the topic

List the formative assessment strategies that will be used in this course below.

Group discussions about readings and student presentations.

3. If the course is to be integrated (i.e., graduate/undergraduate), please list the additional evaluation requirements for graduate students.

Graduate students will be required to present an individual presentation to the class while facilitating class discussion pertaining to their chosen topic. Graduate students will also need to write a term paper on their chosen topic which will be assessed as 24% of their final grade (taken from the weighting of the 3 exams equally).

Bibliography:

4. Please list the required readings for the course (include ebooks, online readings, and open access resources). The reading list must contain complete bibliographical information (full name of author, title, year of publication, etc.).

5. Please list any suggested readings for the course (include ebook, online readings, and open access resources). The reading list must contain complete bibliographical information (full name of author, title, year of publication, etc.)

Recommended textbook - Clinical Autonomic Disorders
3rd edition available for purchase at https://doi.org/10.1212/WNL.0b013e3181cff7c3
Recommended textbook - Principles of Autonomic Medicine v. 4.0
Free for download at https://dir.ninds.nih.gov/publications/PrinciplesofAutonomicMedicinev40.pdf

6. If the course is to be integrated (graduate/undergraduate), a list of the additional readings required of graduate students must be included. If no additional readings are required, a rationale should be provided.

No specific additional readings will be required. However, they will be responsible for writing a term paper on their own chosen topic and therefore, the readings that will be incorporated in those papers are inherently required.

Section E - Resources Requirements:

This section may need to be filled in with the help of your Chair/Manager and operations manager:

1. Computing:

- Indicate the expected hardware, software and need for student access to computing labs, including the number of student access hours needed (e.g. access to teaching computer lab with SPSS installed; students required to bring their own device). Provide cost of software, where possible. Indicate, what the cost will be for the students, if any?

The students will use iClicker for in-person quizzes, eClass for after class quizzes, and freeware software for laboratory analysis. If students do not have access to computers, smart phones and/or these programs, alternatives will be provided. No costs are anticipated.

2. Classroom:

- Indicate the expected specialized classroom needs (e.g. moveable table and chairs; audio/visual equipment; WIFI to support students with bringing their own device)

Movable tables and chairs will help with small group discussions. Wifi in the classroom will be needed for iClicker questions on their own devices. Regular presentation/projector equipment will be needed for powerpoint presentations.

3. Teaching Support:

- Does the course require technical support? (e.g. lab technician; UIT support). NO
- Does the course require a tutorial or lab in addition to lecture/seminar hours? NO
- Does the course require marker/grader, teaching assistant, lab demonstrator etc. support above those normally allocated by the department/school offering the courses? NO
- If the course includes off campus practicums/placements or field experiences, such as students working with a community partner, indicate:
- Will the instructor need to travel to visit the off-campus community partner(s)? NO
  - Will the experiential Education Coordinator be required to support and maintain the experiential education component while the course is being offered? NO
  - Is the placement intended to be domestic or international, or both?
- If the course is blended or online, indicate whether the support of the eLearning specialist is required? NO

Revise September 2020

Library Support Statement

HH/KINE 4xxx. 3.0 - Autonomic function in health and disease

I have reviewed the course proposal and the supporting reading list, and find that York University Libraries (YUL) have the required resources to support this undergraduate course based on the following criteria:

- Books (including e-books & e-chapters), handbooks and visual resources
- Print and electronic journals
- Kinesiology & Health Sciences, Neuroscience & Biology: YUL course guides
- Data & statistical sources available from the Libraries website
- Access to other libraries' holdings through Interlibrary Loans and resource sharing
- Ongoing purchases of new library materials based on course requirements
- Librarians' assistance with finding and using research information for appropriate purposes

A York Libraries OMNI catalogue search shows that there are numerous resources on human anatomy & physiology, brain, autonomic nervous system and chronic clinical conditions including autonomic dysfunction. York University Libraries have print and electronic resources, e-book chapters on different aspects of the brain and neuroscience including sympathetic and parasympathetic nervous system. There are many resources related to critical thinking & writing in the sciences & health sciences. Students and faculty have access to Primal Pictures (Anatomy TV): Human Anatomy & Physiology http://researchguides.library.yorku.ca/ee and MIT CogNet: http://cognet.mit.edu.ezproxy.library.yorku.ca/
York University Omni Library search interface is the starting point for locating all resources including material in the reading list.

Some important databases include,

- Medline (PubMed) & Medline (Ovid)
- Primal Pictures/Anatomy TV
- Biological Abstracts
- Scopus
- Web of Science
- MIT CogNet

The Kinesiology & Health Sciences, Neuroscience and Biology library guides are excellent resources for locating subject specific databases, encyclopedias, books and dictionaries.

Kinesiology & Health Sciences: http://researchguides.library.yorku.ca/kinesiology
Neuroscience: http://researchguides.library.yorku.ca/neuroscience
Biology: http://researchguides.library.yorku.ca/biology
YUL Data Library Guide: http://researchguides.library.yorku.ca/data
More databases: http://researchguides.library.yorku.ca/az.php

The Libraries subscribe to all the important Kinesiology & Neuroscience journals including the books that will be required for this course.

Placing items on Reserve desk 2021: https://www.library.yorku.ca/web/ask-services/facultyinstructor-support/places-items-on-reserve/

Online Reserve request form: reserves.library.yorku.ca

Students can request books (loans) and journal articles that are not available at York by RACER: http://www.library.yorku.ca/e/resolver/id/1534609

YUL Librarians also provide library research skills through workshops on topics, including:

- Formulating search strategies and helping with subject specific databases
- By creating customized course guides for help with library resources
- Helping with evaluating information sources
- Managing and organizing references using citation management tools

Library Class Request: https://www.library.yorku.ca/web/ask-services/facultyinstructor-support/book-a-library-class/

There may be specific areas that require additional resources. Collection development in the library is an ongoing process. It is based on a commitment to developing library resources that are in alignment with the University's curricular and research activities. Please forward any additional requests for purchase to the Science Librarian, Rajiv Nariani, at rajivn@yorku.ca.

In summary, I would state that the York University Libraries are well-positioned to support this undergraduate course.

Sincerely,

Rajiv Nariani
Science Librarian
102L, Steacie Science and Engineering Library
York University
Toronto, ON
rajivn@yorku.ca
25th August 2021

YORK
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UNIVERSITY INFORMATION TECHNOLOGY

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November 5, 2021

Dear Professor Edgell,

University Information Technology (UIT) is committed to the support of eLearning for the academic community and supports many technologies that underpin those efforts, include eClass as York's primary learning management system. Within eClass a wide array of tools are made available to support pedagogical needs for information delivery, communications between course participants, assessment, collaboration and others. UIT also provides many additional computing supports including labs and access to software, either for purchase or via MyApps. Additionally, Learning Technology Services (LTS) provides primary support to courses and instructors within the Faculty of Health.

Related specifically to this proposed course, access to eClass for course materials and online quizzes is fully supported by LTS, as is iClicker for in class quizzing. Projection requirements provided by Audio Visual Support Services within UIT is also a routine request given sufficient lead time in booking resources.

With these supports in place I'm happy to confirm UIT support of "Autonomic function in health and disease."

I wish you well on your proposal for this course.

Sincerely,

Rob Finlayson

Rob Finlayson

Manager, Learning Technology Services
University Information Technology

TENTANDA VIA

Department of Biology Course Outline

SC/BIOL 3380 3.0 Sensory Systems
Winter, 2021
(version: Jan 21, 2021)

Course Description

This course explores sensory systems in humans, animals and machines, and how they control action, behavior and physiological state. Adopting a comparative approach, we focus on highly specialized sensory systems and unusual, often surprising solutions to sensory challenges.

Three lecture hours. One term. 3.0 credits.

Prerequisites (strictly enforced)

BIOL 3060 4.0 or PSYC 2220 3.0

Course Instructor(s) and Contact Information

Course Director:

Dr. Niko Troje

troje@yorku.ca

Department of Biology
Life Sciences Building,
Office: 429 B

Office Hours: By appointment

If you contact me by email. please include “BIOL3380” in the subject line, and your full name and student number in the text of your email.

Schedule

Lectures: Tuesdays and Thursdays from 5:30pm – 7:00pm

Classes are applied synchronously, and attendance is required.

Evaluation

Grading:	Midterm exam	25%
	Final exam	35%
	Participation breakout sessions incl. completion of worksheets and peer-grading other students	40+%
	Bonus marks for your peer-grading performance (at instructor's discretion, up to max. 10%)	

Important Dates

Reading Week: February 13-19, 2021

Midterm test: February 25, 2021

NOTE: For additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at https://registrar.yorku.ca/enrol/dates/fw20

Resources

eClass	https://eclass.yorku.ca
	I will use it as a repository for slides and lecture recordings. We will also use it to run the midterm and final exam.
Zoom	Please make sure you have a York Zoom account, as Passport York authentication will be required to enter live Zoom sessions. Please go to https://yorku.zoom.us/ to set up your YorkU Zoom account.
	Once setup, log in via SSO.
Reading 1 (recommended)	Martin Stevens: Sensory Ecology, Behaviour, & Evolution. Oxford University Press, 2013
	180 day access to online version costs $32, Hardcopy more expensive.
	https://www.vitalsource.com/en-ca/products/sensory-ecology-behaviour-and-evolution-martin-stevens-v9780191651472
Reading 2 (recommended)	Kenneth Catania: Great Adaptations Princeton University Press, 2020
	eBook for $38. Hardcopy is about the same.
	https://www.vitalsource.com/en-ca/products/great-adaptations-kenneth-catania-v9780691209555
Kritik.io	Kritik is a peer-grading platform that distributes fair and accurate assessments by harnessing collective intelligence to simplify workflows and reduce turnaround time on feedback.
	Subscription is required and costs $15 for the term. Please watch your email for an invitation to order your subscription.

Learning Outcomes

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

- Describe the function of the specialized sensory mechanisms (such as visual acuity, eye movements and stereopsis) in humans and how they are used to control action, behavior and physiological state.
- Describe alternative solutions to similar problems in a variety of animals.
- List evolutionary and physical constraints that lead to these solutions.
- Evaluate technical solutions to sensory problems in robotics and automation.
- Explain how sensory processes are integrated into control structures to result in functional systems.
- Analyze published literature, including experimental data, about specialized sensory systems.
- Extract and communicate key concepts from original, empirical literature both orally and in writing.
- Defend scientific theories related to specialized sensory mechanism with logical reasoning.
- Compare theoretical terms and concepts related to specialized sensory mechanism to the reality of empirical science.

Course Content

1. Introduction
2. Light and eyes
3. Colour and wavelength
4. Depth perception
5. Bayesian inference
6. Loudness and timbre
7. Sound localization
8. Active sensing
9. Touch and haptics
10. Unusual and unfamiliar senses
11. What is real?
12. Communication

Depending on how the course proceeds, the last few topics may change.

Copyright Protection of Course Material

Course Policies

Missed Breakout Exercises, Mid-term Exam, or Final Exam:

Missed breakout exercises and offline assignments

We will conduct small exercises every class. Generally, they are combined with short group discussions with one or more other students in a Zoom breakout room during class time. If you miss a breakout session you get zero marks for it. Breakout exercise cannot be re-opened after they close. Also, since activity deadlines cannot be extended, I already built extra time into the activity deadlines.

Don't worry too much if you miss a session here and there. The breakout exercises contribute 40% to the final mark. However, over all exercises, you can collect even more marks (up to 50). The 20% of the activities where you received the lowest marks (or 0 marks) will not be counted towards the final mark.

Missed midterm

Any student who is absent from the mid-term without a valid reason will receive a grade of zero for this exam. If you do have a valid reason that you communicate in writing to the Course Director, the percentage of the midterm will be added to the final exam.

Students who feel that there are extenuating circumstances that may interfere with their ability to successfully complete the course requirements are encouraged to discuss the matter with the Course Director as soon as possible.

Students with physical, learning or psychiatric disabilities who require reasonable accommodations in teaching style or evaluation methods should consult with the Office for Persons with Disabilities (OPD) and ensure that requests for appropriate accommodations are arranged with the Course Director early in the term.

Missed final exam

If you miss the final examination please complete and submit a Deferred Standing Agreement (DSA) form available from the Registrar's website to troje@yorku.ca (subject: BIOL3380) together with a letter outlining the reason for missing the exam, within one week of the missed exam.

See "Deferred Standing Guidelines" on the course eClass site for further details: https://myacademicrecord.students.yorku.ca/deferred-standing

If you are approved to write a deferred exam, an in-person final exam will be arranged on campus whenever approval to do so is granted. The format of the deferred final exam may be different from the main exam and might include to write an essay, short answer, multiple choice, or a mix of these options.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - http://www.yorku.ca/academicintegrity/

Important A note from the Faculty of Science Committee on Examinations and Academic Standards:

Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g. Course Hero, One Class, etc.) were taken and used by unknown students in later offerings of the course. The Faculty's Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met, since the uploading students had been found in all cases to be wilfully blind to the reasonable likelihood of supporting plagiarism in this manner. Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero or One Class, the submitting student will be charged with plagiarism and the uploading student will be charged with aiding and abetting.

Note also that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Scanning, sharing, uploading or publishing these documents constitutes copying, which is a breach of Canadian copyright law, and the breach is aggravated when scans are shared or uploaded to third party repository sites.

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Student's in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Student Accessibility Services - https://accessibility.students.yorku.ca

York Accessibility Hub - http://accessibilityhub.info.yorku.ca/

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete and submit an accommodation request form

https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.pdf

at least 3 weeks before the exam period begins.

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/

Faculty of Health
School of Kinesiology and Health Science

Course: KINE 4226 3.0 – Principles of Neurorehabilitation **Course webpage:** eClass

Term: Winter 2022

Prerequisite/Co-requisite: HH/KINE 3020 3.0 – Skilled Performance and Motor Learning

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Course Director
Dr. George Mochizuki
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Office: 363 Bethune College, x22202
Office hours: Arrange through email

Teaching Assistant
Hajr Hameed
Email: hhameed@yorku.ca

Time and Location
Lectures: (TBD)
Experiential Education Activity: offsite – see schedule below

Course Description
This course examines principles and clinical best practices for implementation of neurorehabilitation strategies following neurologic injury. Students will be introduced to processes of neuroplasticity and repair and the use of assistive technologies to facilitate neurorehabilitation interventions for upper and lower limb motor deficits. Students will be exposed to current models and views on the organization and scope of the field of neurorehabilitation. In addition, the course will provide students an opportunity to appreciate the consequences of neurologic injury on typical motor function and how motor learning principles and neuroplastic processes can be used to remediate function.

An important component of this course is engagement and interaction with clinicians (physicians or therapists) and/or researchers in the field of neurorehabilitation currently working in hospitals or private clinics, as well as interaction with individuals with neurologic injury. This engagement will enable students to directly interact with neurorehabilitation practitioners and patients in the community to understand the benefits, challenges, and impact of neurorehabilitation services. Interviews, discussion, and reflection with these individuals will contribute to a broader understanding of the principles of neurorehabilitation. In addition, students will have an opportunity to apply and synthesize the knowledge gained through in-class content and the Experiential Education activity by working through and reporting on relevant case studies.

Learning Objectives
The purpose of this course is to:

- introduce students to current theoretical models for classifying disability in the context of neurorehabilitation.
- provide students an opportunity to recognize the consequences of neurologic injury on typical motor function and how motor learning principles and neuroplastic processes are used to remediate function.
- enable direct student engagement and interaction with neurorehabilitation practitioners and patients in the community to develop awareness of the benefits, challenges, and impact of neurorehabilitation services.
- develop skill in applying and synthesizing knowledge gained from in-class and off-campus interactions to solve problems from a neurorehabilitation perspective in individual cases.

Learning Outcomes

By the end of this course, students will be able to:

- describe current theoretical models for classifying disability in the context of neurorehabilitation.
- apply knowledge of principles of motor learning and neuroplasticity to develop rehabilitation strategies in specific case studies.
- evaluate the utility, challenges, and impact of neurorehabilitation based on the perspectives of clinicians and their patients.
- describe historical and contemporary views on approaches for augmenting neurorehabilitation for upper and lower limb impairment.

Course Text/Readings

- Oxford Textbook of Neurorehabilitation. Volker Dietz and Nick Ward (editors). Oxford University Press, Oxford, UK. 2015. **ISBN**: 978-0-19-967371-1
- **Supplemental reading**: Motor control: Translating Research into Clinical Practice, 4th Ed. Anne Shumway-Cook and Marjorie Woollacott. Wolters Kluwer/Lippincott, Williams & Wilkins, Baltimore, 2010. 3rd and 5th editions available On Reserve in the Steacie Science Library.

Lecture Schedule – Winter 2022
Time/Location: TBD

LECTURE / DATE	TOPICS	READINGS Dietz and Ward
Week 1 (January 10)	T: Introduction to the course/WHO International Classification of Disability Th: Models of disability in the context of neurorehabilitation	Chapter 1 Chapter 1
Week 2 (January 17)	T: Neurorehabilitation approaches: a historical perspective Th: Neurorehabilitation approaches: a contemporary perspective	Assigned readings in eClass
Week 3 (January 24)	T: Neurologic Injury – stroke Th: Neurologic Injury – traumatic brain injury	Assigned readings in eClass
Week 4 (January 31)	T: Neurologic Injury – multiple sclerosis Th: Neurologic Injury – spinal cord injury	Assigned readings in eClass
Week 5 (February 7)	T: Neuroplasticity Th: Neural repair	Chapters 12 & 13 Chapters 12 & 13
Week 6 (February 14)	T: Midterm exam (Weeks 1-5) – in class Th: Experiential education activity overview: expectations, professionalism, privacy/confidentiality/anonymity (in class)	-- Chapter 2
Week 7 (February 21)	Reading week – no class	--
Week 8 (February 28)	T: Experiential learning activity (in community) Th: Experiential learning debrief/reflection time	-- --
Week 9 (March7) Experiential learning reports/reflections due March 11	T: Interdisciplinary approach to neurorehabilitation Th: Motor re-learning in neurorehabilitation	-- Chapter 7
Week 10 (March 14) March 18 – last date to drop without receiving a grade	T: Upper limb neurorehabilitation Th: Upper limb neurorehabilitation	Chapter 19 Chapter 20
Week 11 (March 21)	T: Lower limb neurorehabilitation Th: Lower limb neurorehabilitation	Chapter 18 Assigned readings
Week 12 (March 28)	T: Neurorehabilitation technology Th: Neurorehabilitation technology	Chapter 29 Chapter 30
Week 13 (April 4) Case reports due April 8	T: Assistive Devices Th: Assistive Devices	Chapter 31 Chapter 32

FINAL EXAM (Weeks 9-13) **during exam period**, date to be determined

EVALUATION

Final Grade

The final grade for the course will be based on the following items weighted as indicated:

- Case study 40%
- Experiential learning report and reflection statement 20%
- Mid-term examination 20%
- Final examination 20%

1. **Case study**: One way to demonstrate learning is to apply course-specific knowledge to solve a problem described in a specific case or scenario. The application of in-class knowledge to real-world scenarios facilitates opportunities to translate knowledge into action, similar to what you will do when you transition into the workforce upon completion of your degree. For this exercise, students will be randomly assigned into groups of 4-5 students (depending on class size). As a group, students will develop the details of the case and will develop a question/problem based on the case that is to be addressed. Students will then provide a detailed description of how the problem is to be addressed, based on the relevant information that was taken into consideration to address the problem. As an example, if students describe a case about a 65-year-old man with stroke with a history of falls, students may task themselves with developing a neurorehabilitative approach for reducing fall risk. The problem-solving description may include pathophysiology of stroke disease (in contrast to an intact central nervous system), a description of the fall prevention program based on current knowledge and best practice, and a justification of the choice of intervention, all in the context of the details provided in the case.

The report (1 per group) should be no more than **6 pages** in length (double spaced, 12pt Times New Roman font, 2cm margins) with **1 extra page** for a title page (title, names, date of submission, student IDs) and **unlimited additional** pages for references (minimum of 15 appropriate references). Include a running header (top left) and page numbers (bottom right) on all pages. In-text referencing should follow APA style.

Evaluation of the report will include 15% as graded by the Course Director using the attached rubric and 5% as determined by self- and peer-evaluation using the attached rubric (20% total).

2. **Experiential Learning Report and Reflection Statement:** Students will work in groups (4-5 students per group, depending on class size) to engage with a community partner in a single off-campus meeting for an Experiential Education activity. For this activity, students will conduct a semi-structured interview with a clinician/researcher in the area of neurorehabilitation. The aim is to also engage in an interview/discussion with an individual undergoing neurorehabilitation or a research participant in a neurorehabilitation study. If the patient is unavailable, the Experiential Education activity will involve interacting with the clinical facilitator. If the in-person interview with the clinical facilitator is not feasible, a video call will be set up between students and the off-campus clinical facilitator. Current Public Health guidelines will be followed for these interactions.

This activity is meant to have the students understand personal perspectives on the impact and challenges of neurorehabilitation from a 'deliverer' and 'receiver' point of view. However, in situations where only the clinician is available (without the patient), it will still be possible for students to explore personal views on impact and challenges from the perspective of the clinician alone. The students in these groups will be able to achieve the same learning outcomes as those who may interact with both the patient and clinician. In either case, the input from the clinician is prioritized as they will serve as a model for the profession in which students may have an interest in pursuing.

The evaluative component of this activity will include a written report/summary of the interview that was conducted (10% of final grade) and a written reflection of the Experiential Learning activity (10% of final grade).

The interview summary (1 per person) should be no more than 5 **pages** in length (double spaced, 12pt Times New Roman font, 2cm margins) with **1 extra page** for a title page (name, date of submission, student IDs). The reflection can be included in the same file (under a separate heading) and should be no more than **3 pages** in length (double spaced, 12pt Times New Roman font, 2cm margins).

3. **Examinations (synchronous mode)**: There will be one midterm and one final examination. The examinations must be written at the date and time noted in the lecture schedule. Students must make themselves available to write the exams at the specified date and time.

The format of both exams will be short answer and essay style questions based on case studies presented in the exam. Students must apply the knowledge they have developed to answer questions related to the cases. On the specified date, all students will receive the exam at the same time and will be given a **1.5 hour window** (Midterm) or **2 hour window** (Final) to complete the exam.

Questions will be related to weekly lecture content and discussion forum readings. The final examination is **cumulative** (i.e. will cover material from the beginning of the course). Each exam is worth 20% of the final grade.

Grading: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, C+ = 5, etc.). Assignments and tests will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.) (For a full description, see the York University Undergraduate Calendar: http://calendars.registrar.yorku.ca/pdfs/ug2004cal/calug04_5_acadinfo.pdf)
An appeal against a grade assigned to an exam must be made in writing to the Course Director. The entire exam will be regarded by the Course Director. The result of an appeal may cause the grade to increase, decrease or remain the same.

Assignment Submission: Proper academic performance depends on students doing their work not only well, but on time. Accordingly, assignments for this course must be received on the due date specified for the assignment. Case studies and Interview Summaries/Reflections are to be submitted on eClass by 11:59pm EDT (or EST, as appropriate) on the date specified in the course schedule.

Lateness Penalty: Written assignments received later than the due date will be penalized one-half letter grade (1 grade point) per day that assignment is late. Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc., may be entertained by the Course Director but will require supporting documentation (e.g., a doctor's letter).

RE-EVALUATION POLICY

During the term: Any requests for remarking of in-class tests must be received in writing by the course instructor within 7 days of the item's mark being posted. Note that your mark may be ***raised, lowered, or confirmed.***

Re-appraisal of a final grade: Any requests for re-appraisal of a final mark must be received by the course instructor within 7 days of the final grade posting. Please note that your mark may be ***raised, lowered, or confirmed.*** For further details, go to: http://gradstudies.yorku.ca/current-students/regulations/courses-grading/#reappraisals.

MISSED TESTS

Only students with a legitimate reason for missing a class test, which is confirmed by official documentation*, may request accommodation from the Course Instructor. Written documentation should be submitted to the Course Director at the next meeting of the class. If a class test is missed, the percentage allocated to the missed exam will be added to the final exam. If a student misses an exam with no legitimate excuse, the student will receive a grade of zero for the missed test. Further extensions or accommodation will require students to submit a formal petition to the Faculty. In the case of a sudden emergency, contact me as soon as possible. If you cannot reach me, a message can be left on my office voicemail, which records the date and time of your call.

*Official Documentation - Documentation must be provided by a registered clinical psychologist, psychiatrist, or medical doctor indicating that you were indeed unable to attend on the specific date of the examination because of your specific problem.

IMPORTANT INFORMATION FOR STUDENTS

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