School of Public Health
Syllabus and Course Information

UNIVERSITY OF MINNESOTA
Driven to Discover℠

PubH 6100- 005
Theoretical and Computational Complexity

Spring 2017

Credits: **3 credits**

Meeting Days: Thursday night

Meeting Time: 4:00pm - 6:30pm

Meeting Place: Science Teaching & Student Services, Bruininks Hall, 222 Pleasant Street SE, Minneapolis, MN 55455

Instructor: **Prof. Matteo Convertino**

Office Address: **1232 Mayo Building, 420 Delaware St. SE, Minneapolis, MN, 55455**

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Office Hours: **After class for brief Q/A email for an appointment**

I. Course Description

Complex system science aims to serve as a crucial and cornerstone tool in public health. Very often, in health problems one has to understand and manage the complex network of many different factors that affect a particular outcome or multiple outcomes (diseases), and one has to assess how these factors interact for designing strategies that control these interactions optimally. The control of driving factor interactions minimizes the systemic disease risk, or equivalently maximizes resilience, of populations. Public health and medical researchers are at a point where they have a very good understanding of many of the factors affecting health - from environmental to social and biological causes - but now they are finding that spatio-temporal interactions of these factors is often more important in determining health outcomes as for any complex adaptive system. For instance, infectious, communicable, and chronic diseases are the result of multiple interacting exposures with spatio-temporal heterogeneities. Such disease dynamics can be modeled with complex systems science tools.

Complexity science for health complexity is a cross-disciplinary research field that takes a unique system dynamics view of health, examining all aspects of complexity in space and time of any health-affecting systems (such as natural ecosystems and industrial systems) to untangle health issues. This computational system approach is aligned with other research to analyze via modeling the interactions of cells, individuals, health systems (healthcare and governance), and local/global populations as a function of natural and man-induced stressors. This engineering-inspired effort is developing universal data analysis, models, theories, and technology easily

modeling the interactions of cells, individuals, health systems (healthcare and governance), and local/global populations as a function of natural and man-induced stressors. This engineering-inspired effort is developing universal data analysis, models, theories, and technology easily transferable among systems and diseases for public health. The approach teaches not only how to simplify and reproduce systems, but also how to bring together experts from different disciplines (engineers, physicians, veterinarians, biologists, artists, and any stakeholder) to understand system complexity and develop models as real-time technology for solving worldwide health issues via quantitative based predictions, model-guided monitoring, preventions/interventions and quantitative based policy making.

The course will frame any theoretical part into engineering solutions to for diagnosis, etiognosis and prognosis of diseases in individuals and populations. In this regard, the content will mostly present hydro- and eco-epidemiology theory that can help for the design of civil, environmental and biological engineering controls useful for population health. Vegetative buffer filters, expansion areas, and flow routing controls are examples of such engineering controls. For instance, vegetative buffer strips are presented for ecological (increase species richness system wise), hydrological (water quality and runoff slow down useful for floods), and biogeochemical function (retention of pathogen and toxicants). Models for optimal surveillance network, and other network types are also presented.

The course aims to provide systems science tools that are useable in research and real practice in any field of interest. Thus, students from any background – e.g., public health, veterinary medicine, engineering, ecology, biology, sociology, and medicine – are welcome to enroll. Enhancement of diversity and the ability to integrate a large and diverse body of knowledge in team projects is one of the objectives of the course.

Students will be introduced to the most important models of biological and social processes, teaching them how to develop, analyze, criticize, and test hypothesis. Particularly, the course will present an overview of theoretical foundations and applications of models for reproducing biological systems with focus on population health and incorporation of these models with classical epidemiological models. The lectures will encourage students to elaborate existing models and develop new models based on the ones made available.

(1) *Complexity: Introduction and Fundamentals.* What is it? Why does it matter? Why different is more? How to simplify complexity? Transdisciplinarity as the essence of health. Quantitative models. Systemic epidemiology and ‘’One Health” perspective.

(2) *Modeling: Fundamentals.* Why? How? Philosophy of modeling, system theory, and complex systems. Examples in biomedical, biological, behavioral, environmental, health and clinical research. Are socio-ecological, biological, and organizational systems different than engineering systems? Emphasis on civil and environmental engineering structure to control diseases.

(3) *A Special Complexity Class: Networks.* A subset of complex systems: complex networks, statics and dynamics.

(4) *Properties of Complex Systems.* Emergence, scaling, universality, power-laws and other probability distribution classes, fractals, scale and resolution invariance. Beyond statistics: fundamentals of stochastic processes and how stochasticity allows one to explore system state landscapes.

(5) *Tools for ‘’Life Imperfection”: Uncertainty.* Global sensitivity and uncertainty analyses, metamodeling, model calibration and validation, tests for predictions. Example for communicable and non-communicable diseases.

(6) *Digging into ‘’the Truth”: Causal Methods for Big and Small Data.* Data analysis techniques for assessing causation: dynamic factor analysis, Granger causality, convergence cross mapping, scaling analysis, MaxEnt models.

(7) *Biology as Art: Analysis of Patterns and Biological Models.* Theoretical biological abstraction: Individuals, metapopulations, metacommunities, system types and traits, individual and system behavior, transitory and stationary dynamics, environmental dynamics (focus on water, climate, and ecology), dynamic network biomarkers, tipping points. Definition of Optimal Transmission Networks and reaction-diffusion processes.

(8) *Virtual reality: Models as Human-Computer Interaction.* Dynamical System modeling: agent-based modeling, physical-based metapopulation and

(8) *Virtual reality: Models as Human-Computer Interaction.* Dynamical System modeling: agent-based modeling, physical-based metapopulation and metacommunity modeling, statistical modeling. Drawing from simplicity: design by analogy concept. Emphasis on hydrology as a theory useful for system epidemiology.

(9) *System Centric: Systemic Risk and Resilience.* Complex risk networks and resilience in complex systems; a health and biological perspective.

(10) *Managing Complexity: Decision Science Models.* Decision analytical models for system management: Multi-Criteria Decision Analysis models, portfolio decision modeling, probabilistic decision networks, sequential decision modeling (strategy). Enhanced adaptive management models. Examples of portfolio benefit-cost analysis for infectious diseases are provided. Implication for a consequentialist epidemiology.

(11) *''We Complex People": Mental Models.* Assessing stakeholder preferences. How and why that is important for sustainability. Gaming methods and participatory modeling.

(12) *''All in a Box": Model Integration and Computational Complexity.* Models integration and large scale project example of integrative research/application. How to integrate different models/dynamics and structure input/outputs of model/processes.

(13) *''Eye and Ears' Joy": Visualizing Data.* Is modeling all? Scientific visualization and communication in science. The importance of communication in science and how that can be enhanced via modeling.

(14) *''Thinking back": Integration of Models for Technology Design.* Opportunities of complexity science for designing systems/technology, and further projections of complexity science to develop knowledge and stakeholder action. Social and technological innovations for health and integration with modeling in a dynamical way. Real-time use of models for biomedical informatics, environmental, and computational biology applications.

II. Course Prerequisites

Highly motivated students are welcome. All students with background in computer programming, mathematics, statistics, probability, and physics are highly encouraged to enroll. Considering the heterogeneity of the student body in the course, the instructor will present background theories in a way that everyone can understand and link to the material where further information can be found in case of interest.

III. Course Goals and Objectives

1. Ability to become a systems thinker

2. Competence in using mathematical models presented in class (emphasis on MaxEnt, Metacommunity Models, Dynamic Granger Causality Analysis, Network Analysis Models, Global Sensitivity and Uncertainty Analyses, and Portfolio Decision Models)

3. Ability to simplify the complexity of problems, formulate hypotheses, detecting potential driving factors

4. Ability to extend complexity science theory and models to your area of expertise

5. Ability to work in groups bringing together inputs from different people

6. Ability to verify assumptions with quantitative models

7. Ability to summarize results cohesively in a research-paper format

8. Knowledge of the most important models in the field and ability to select models for a given question.

9. Ability to communicate complexity and results effectively

IV. Methods of Instruction and Work Expectations

The course will engage students with a mix of: (i) frontal lectures in which the theoretical basis of models are presented; (ii) power-point / model demos in which data analysis / model simulations

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The course will engage students with a mix of: (i) frontal lectures in which the theoretical basis of models are presented; (ii) power-point / model demos in which data analysis / model simulations are shown in conjunction with (i); (iii) working groups. With a computational driven future just happening, the course presents an integrated view of topics for transdisciplinary research and applications, as well as unique cohort-based learning approach of system design. The focus is on population health in which health is seen as a system and diseases are outcomes of such system as a function of biological, socio-environmental, and organizational dynamics. Thus, concepts, theories and models can be used for other complex systems. A website for the course will be developed

V. Course Text and Readings

Below some fundamental readings are reported in areas covered by the course. Students are strongly encouraged to read papers that are cited in the following references.

1. General Complexity Theory and Networks

A.-L. Barabási, Linked: The New Science of Networks, (Perseus Publishing, Cambridge)

Juyong Park and M. E. J. Newman The statistical mechanics of networks, Phys. Rev. E 70, 066117 (2004).

2. Global Sensitivity and Uncertainty Analyses

Saltelli A, Ratto M, Andres T, Campolongo F. Global Sensitivity Analysis. The Primer. Hoboken: John Wiley & Sons, 2007

3. Complexity Science for Population Health

Helbing, Dirk and Brockmann, Dirk, et al., How to Save Human Lives with Complexity Science (February 3, 2014). Available at SSRN: http://ssrn.com/abstract=2390049 or http://dx.doi.org/10.2139/ssrn.2390049

Brockmann, Dirk, and Dirk Helbing. "The Hidden Geometry of Complex, Network-Driven Contagion Phenomena." Science 342, no. 6164 (2013): 1337-1342

Sturmberg, Joachim P, Martin, Carmel (Eds.), Handbook of Systems and Complexity in Health, 2013, XXII

Menezes R, Evsukoff A, Gonzalez M (2013) A Novel Framework for Complex Networks and Chronic Diseases, by Philippe J. Giabbanelli, Complex Networks Studies in Computational Intelligence Volume 424, 2013, pp 207-215

Lee, DS; Park, J; Kay, KA; Christakis, NA; Oltvai, ZN; Barabási, AL (July 2008). "The implications of human metabolic network topology for disease comorbidity" (PDF). Proceedings of the National Academy of Sciences 105 (29): 9880–9885. doi:10.1073/pnas.0802208105. PMC 2481357. PMID 18599447

Hidalgo, CA; Blumm, N; Barabasi, AL; Christakis, NA (April 2009). "A Dynamic Network Approach for the Study of Human Phenotypes" (PDF). In Meyers, Lauren Ancel. PLoS Computational Biology 5 (4): e1000353. doi:10.1371/journal.pcbi.1000353. PMC 2661364. PMID 19360091

Christakis, NA; Fowler, JH (26 July 2007). "The Spread of Obesity in a Large Social Network Over 32 Years" (PDF). New England Journal of Medicine 357 (4): 370–379. doi:10.1056/NEJMsa066082. PMID 17652652

Christakis, NA; Fowler, JH (22 May 2008). "Quitting in Droves: Collective Dynamics of Smoking Behavior in a Large Social Network" (PDF). New England Journal of Medicine 358 (21): 2249–2258. doi:10.1056/NEJMsa0706154. PMC 2822344. PMID 18499567

Fowler, J. H; Christakis, N. A (3 January 2009). "The Dynamic Spread of Happiness in a Large Social Network" (PDF). British Medical Journal 337 (768): a2338. doi:10.1136/bmj.a2338. PMC 2600606. PMID 19056788

4. Complexity in Environmental Sciences

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Ignacio Rodríguez-Iturbe, Andrea Rinaldo, Fractal River Basins: Chance and Self-Organization, Cambridge University Press, 2001

Hubbell, SP (2001). "The Unified Neutral Theory of Biodiversity and Biogeography, Princeton University Press

5. Others (general and specific readings)

Von Neumann, John, and Oskar Morgenstern. "Theory of games and economic behavior." Princeton University Press, Princeton NJ (1944).

VI. Course Outline/Weekly Schedule

Class topics reflect the content listed in Section II and the suggested readings. Modules will be revised dynamically considering also interests and background of students, and feedbacks. Specific readings will be updated considering the most recent literature. In red the group project classes are highlighted. At the beginning of the course the lecturer will provide multiple opportunities for guided modeling group projects (in Matlab and/or Java and GIS) that will constitute a large portion of the final grade. However, each student will be responsible individually of a project component and related paper.

Week	Topic/Assignment	Readings (Excerpta)
Week 1 (Jan. 19)	Introduction to complexity science and exposition of project topics. Assignment: Paragraph about the topic in the framework of complexity science. Due: next class	Helbing, Dirk and Brockmann, Dirk, et al., How to Save Human Lives with Complexity Science (February 3, 2014). Available at SSRN: http://ssrn.com/abstract=2390049 or http://dx.doi.org/10.2139/ssrn.2390049
Week 2 (Jan. 26)	Networks characterization Assignment: Identify networks in your project. Due: next class	Juyong Park and M. E. J. Newman The statistical mechanics of networks, Phys. Rev. E 70, 066117 (2004).
Week 3 (Feb. 2)	Network Inference. Assignment: Asses the network from data about your problem. Due: next class	Villaverde AF, Ross J, Morán F, Banga JR (2014) MIDER: Network Inference with Mutual Information Distance and Entropy Reduction. PLoS ONE 9(5): e96732. doi:10.1371/journal.pone.0096732
Week 4 (Feb. 9)	Metacommunity models and other predictive analytics Assignment. Set up your predictions for your project. Due: next class	Brockmann, Dirk, and Dirk Helbing. "The Hidden Geometry of Complex, Network-Driven Contagion Phenomena." Science 342, no. 6164 (2013): 1337-1342
Week 5 (Feb. 16)	Evaluation of predictions. Assignment: Formulate your first predictions and assess their accuracy. Due: next class	Saltelli A, Ratto M, Andres T, Campolongo F. Global Sensitivity Analysis. The Primer. Hoboken: John Wiley & Sons, 2007
Week 6 (Feb. 23)	Decision Analytical Models Assignment: Formulate a	Convertino M, Valverde LJ Jr (2013) Portfolio Decision Analysis Framework for Value-Focused Ecosystem Management. PLoS ONE 8(6): e65056. doi:10.1371/journal.pone.0065056

	Assignment: Formulate a decision problem about your project topic and create a MCDA model. Due: next class	for Value-Focused Ecosystem Management. PLoS ONE 8(6): e65056. doi:10.1371/journal.pone.0065056
Week 7 (Mar. 2)	Information Theory for general model-free design of systems Assignment: Perform global sensitivity and uncertainty analysis of your model considering info theory. Due: next class	Lüdtke N, Panzeri S, Brown M, Broomhead DS, Knowles J, Montemurro MA et al (2008) Information-theoretic Sensitivity Analysis: a general method for credit assignment in complex networks. J Roy Soc Interface 5(19):223–235. doi:10.1098/rsif.2007.1079
Week 8 (Mar. 9)	Environmental dynamics with focus on ecohydrological drivers Assignment: Include ecohydrological information in your predictive model. Due: next class	Ignacio Rodríguez-Iturbe, Andrea Rinaldo, Fractal River Basins: Chance and Self-Organization, Cambridge University Press, 2001
Week 9 (Mar. 16)	Model driven approaches in population ecology and biology: from biomarkers to socio-ecological systems Assignment: Continue the project. Due: next class	Stochastic dynamics of cholera epidemics Sandro Azaele, Amos Maritan, Enrico Bertuzzo, Ignacio Rodriguez-Iturbe, and Andrea Rinaldo Phys. Rev. E 81, 051901 – Published 3 May 2010
Week 10 (Mar. 23)	Fractals and ontogenetical models: scaling and universality for big and small data Assignment: Define invariant regimes in your project predictands and scaling factors determining those. Due: next class	Noah, Joseph, and Operational Hydrology - Mandelbrot - 1968, WRR
Week 11 (Mar. 30)	Attractors and non-linear analysis Assignment: Define attractors in your project predictands. Due: next class	Ye, H, **Sugihara** G. 2016. Information leverage in interconnected ecosystems: Overcoming the curse of dimensionality. Science. 353:922-925.
Week 12 (Apr. 6)	Reverse engineering applications of models: inverse problems Assignment: Define optimal nodes in the information provided for your project. Due: next class	Reverse engineering and identification in systems biology: strategies, perspectives and challenges, Alejandro F. Villaverde, Julio R. Banga, Published 4 December 2013.DOI: 10.1098/rsif.2013.0505 Design of optimal ecosystem monitoring networks: hotspot detection …, Convertino et al. (2014)
Week 13 (Apr. 13)	Topological and Functional Optimization (on networks)	A framework for visually interactive decision-making and design using evolutionary multi-

Week 13 (Apr. 13)	Topological and Functional Optimization (on networks) and beyond Assignment: Define optimal solutions for your population outcome. Due: next class	A framework for visually interactive decision-making and design using evolutionary multi-objective optimization (VIDEO) JB Kollat, P Reed Environmental Modelling & Software 22 (12), 1691-1704
Week 14 (Apr. 20)	Pattern analysis from cells to the Earth. Also, tools for data visualization will be shown Assignment: Continue the project. Due: next class	Convertino M, Mangoubi RS, Linkov I, Lowry NC, Desai M (2012) Inferring Species Richness and Turnover by Statistical Multiresolution Texture Analysis of Satellite Imagery. PLoS ONE 7(10): e46616. doi:10.1371/journal.pone.0046616
Week 15 (Apr. 27)	Review of the class topics in the view of a General System Theory based on Information Theory. Assignment: Prepare for final model presentation, report and exam. Due: May 4, 2017	All readings of the course

VII. Evaluation and Grading

Individual project work will be highly considered with respect group work. However, student should always belong to a working group and individual efforts have to be clearly detectable. The project assigned to a working group is one; however, a paper about individual work for the project is assigned to each student singularly.

Attendance is very strongly suggested. The course is based on interactive classes and group projects that cannot be performed individually. Moreover, there is not yet a comprehensive book or course-notes that cover the whole material presented. The course is a dynamical course in which participation is highly valued and requested.

Individual group project papers are mandatory. Failure to provide the final paper will result in failure of the class. The intermediate group project report and the group project discussion will be moment of evaluation via assigned homework and/or class tests.

Course Grading Metrics	Points
attendance*	5
active participation	15
individual paper	40
working group contribution	25
intermediate report/exam	15
	100

GRADE	DESCRIPTION	POINTS
A	Outstanding	>95
A-		90
B+		85
B	Above Average Expectation	>=80
B-		75
C+		65
C	Sufficient	60
C-		55
D+		45
D	Consistently Below Average	40

C-		55
D+		45
D	Consistently Below Average	40
D-		35
F	Failed	<30

The University utilizes plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following:
For additional information, please refer to:
http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html.

Course Evaluation

The SPH will collect student course evaluations electronically using a software system called CoursEval: www.sph.umn.edu/courseval. The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: www.sph.umn.edu/grades. All students will have access to their final grades through OneStop two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Incomplete Contracts

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy
A link to the policy can be found at onestop.umn.edu.

VIII. Other Course Information and Policies

Grade Option Change **(if applicable):**

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at onestop.umn.edu.

Course Withdrawal:

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at sph-ssc@umn.edu for further information.

Student Conduct Code:

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see:
http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Use of Personal Electronic Devices in the Classroom:

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference: http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

Scholastic Dishonesty:

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: http://www1.umn.edu/oscai/integrity/student/index.html. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

Makeup Work for Legitimate Absences:

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see: http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html.

Appropriate Student Use of Class Notes and Course Materials:

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

Sexual Harassment:

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy: http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf

Equity, Diversity, Equal Opportunity, and Affirmative Action:

The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Disability Accommodations:

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center Student Services is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

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If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DRC at 612-626-1333 or drc@umn.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, https://diversity.umn.edu/disability/.

Mental Health and Stress Management:
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: http://www.mentalhealth.umn.edu.

The Office of Student Affairs at the University of Minnesota:
The Office for Student Affairs provides services, programs, and facilities that advance student success, inspire students to make life-long positive contributions to society, promote an inclusive environment, and enrich the University of Minnesota community.
Units within the Office for Student Affairs include, the Aurora Center for Advocacy & Education, Boynton Health Service, Central Career Initiatives (CCE, CDes, CFANS), Leadership Education and Development –Undergraduate Programs (LEAD-UP), the Office for Fraternity and Sorority Life, the Office for Student Conduct and Academic Integrity, the Office for Student Engagement, the Parent Program, Recreational Sports, Student and Community Relations, the Student Conflict Resolution Center, the Student Parent HELP Center, Student Unions & Activities, University Counseling & Consulting Services, and University Student Legal Service.

For more information, please see the Office of Student Affairs at http://www.osa.umn.edu/index.html.

Academic Freedom and Responsibility: *for courses that do not involve students in research:*
Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.*

OR:

Academic Freedom and Responsibility, for courses that involve students in research

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined
by the instructor, it includes the freedom to discuss relevant matters in the classroom and conduct relevant
research. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for
critical judgment and to engage in a sustained and independent search for truth. Students are free to take
reasoned exception to the views offered in any course of study and to reserve judgment about matters of
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When conducting research, pertinent institutional approvals must be obtained and the research must be
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Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, (Dr Kristin Anderson, SPH Dean of Student Affairs), or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

** Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

Student Academic Success Services (SASS): http://www.sass.umn.edu:
Students who wish to improve their academic performance may find assistance from Student Academic Support Services. While tutoring and advising are not offered, SASS provides resources such as individual consultations, workshops, and self-help materials.

Template update 9/2014