USC Dornsife
Dana and David Dornsife
College of Letters, Arts and Sciences
Spatial Sciences Institute

SSCI 684, Spatial Modeling with GIS

Syllabus

Units: 4

Term—Day—Time: Spring, 2018, Mondays, 2:00 p.m. – 4:50 p.m.

Location: Spatial Sciences Institute, AHF 57G

Instructor: Laura C Loyola, Ph.D.
Office: AHF B56G
Regular Office Hours: Mon 10:00-11:00 a.m. and Tues 1:00-2:00 p.m. PT. Also available by appointment.
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Library Help: Andy Rutkowski
Office: VKC B36B
Hours of Service: Tuesdays, 10:00 a.m.-12:00 noon; Thursdays 4:30-5:30 p.m., or other times by appointment
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Course Description
This course explores how geographic information systems and related technologies (global positioning systems, remote sensing, etc.) can be used to promote and support the construction and simulation of dynamic models of human and environmental systems. The fundamental feature of such systems involves diffusion over time and space and individual cases may range from diffusion of pollutants and invasive species across landscapes to the diffusion of disease by contact between individuals. The approaches used to model these phenomena may range from the continuous representation of system dynamics to the discrete interactions of individual, agent-based models. The measurement and modeling techniques that can be used to describe spatially distributed processes and patterns affecting human and environmental systems will be introduced with an assortment of weekly readings and discussions. The course is aimed at doctoral students and a series of individual and group projects allow class participants to develop and use their own models for more detailed research. Calculus and programming experience may be helpful but are not required. In addition to the textbooks, exercises and readings will be provided from a variety of sources as required.

Learning Objectives
On completion of this course, students will be able to:

- Describe the fundamental building blocks (data sources, data models, spatial analysis methods, programming tools, etc.) used in geographic information technologies and spatial models.
- Discuss how dynamic spatial models have been implemented to both simulate the functioning of human and environmental systems and understand their behavior under altered conditions.
- Discuss the ways in which advances in our knowledge of human and environmental systems on the one hand and computer technologies on the other hand have combined to allow more realistic and detailed representations of the spatiotemporal variability of these systems in spatial models.
- Discuss the impact of sampling, resolution, uncertainty, and error on spatial model outcomes and some of the new opportunities afforded by modern instrumentation and measurement techniques.
- Critically evaluate the types of models that will be required in the future to effectively manage land, water, air and biotic resources, assess environmental risks, and promote human health and well-being.

Prerequisite(s): None
Co-Requisite (s): None
Concurrent Enrollment: None
Recommended Preparation: Students must be enrolled in an existing USC PhD program

Course Notes
The course will be taught as a seminar and class meetings will be used to discuss the assigned readings and any questions and related topics that arise from the readings. The learning and teaching strategies are student-centered. They aim to encourage a deep-learning approach by using reflection and self-evaluation. The individual class sessions will be organized around class readings that are designed to provide the essential background and framework for study. Students will be required to reflect on their learning through in-class discussions and a series of carefully crafted assignments.

Technological Proficiency and Hardware/Software Required
Students are expected to have a working knowledge of GIS and the Microsoft Office suite. The modeling software and geospatial data required for course assignments will be accessed using computing resources provided by the Spatial Sciences Institute.

Required Readings and Supplementary Materials

1. Brimicombe, Allen. 2010. *GIS, Environmental Modeling, and Engineering* 2nd ed. Boca Raton: CRC Press.
2. Cooke III, William H., Katarzyna Grala, and Robert C. Wallis. 2006. "Avian GIS Models Signal Human Risk for West Nile Virus in Mississippi." *International Journal of Health Geographics* 5, no. 36.
3. Miranda, Marie Lynn, Rebecca Anthopolos, and Douglas Hastings. 2011. "A Geospatial Analysis of the Effects of Aviation Gasoline on Childhood Blood Lead Levels." *Environmental Health Perspectives.* 119, no 10: 1513-1516.
4. Miranda, Marie Lynn, Dana C. Dolinoy, and M. Alicia Overstreet. 2002. "Mapping for Prevention: GIS Models for Directing Childhood Lead Poisoning Prevention Programs." *Environmental Health Perspectives* 110, no. 9: 947-953.
5. O'Sullivan, David and George Perry. 2013. *Spatial Simulation: Exploring Pattern and Process.* Oxford: Wiley-Blackwell.
6. Skidmore, Andrew, 1st ed. 2002. *Environmental Modeling with GIS and Remote Sensing.* London: Taylor and Francis.
7. Gold, Christopher M. 2006. "What is GIS and What is Not?" *Transactions in GIS* 10, no. 4: 505-519.
8. Goodchild, Michael F. 2011. "Formalizing Place in Geographic Information Systems." In *Communities, Neighborhoods and Health: Expanding the Boundaries of* Place, edited by Burton, Linda M., Susan P. Kemp, ManChui Leung, Stephen A Matthews, and David T. Takeuchi, 21-33. Berlin: Springer.
8. Goodchild, Michael F., May Yuan, Thomas J. Cova. 2007. "Towards a General Theory of Geographic Representation in GIS." *International Journal of Geographical Information Science* 21, no. 3 (March): 239-260.
10. Stewart, Kathleen, Junchuan Fan, and Emily White. 2013. "Thinking About Space-Time Connections: Spatiotemporal Scheduling of Individual Activities." *Transactions in GIS* 17, no.6: 791-807.

11. Wilson, John P. and Peter A. Burrough. 1999. “Dynamic Models, Geostatistics, and Fuzzy Classification: New Sneakers for a New Geography?” *Annals of the Association of American Geographers* 89: 736-46.
12. Bhaduri, Budhendra, Edward Bright, Philip Coleman, and Marie L. Urban. 2007. “LandScan USA: A high resolution geospatial and temporal modeling approach for population distribution and dynamics.” *GeoJournal* 69, No. 1/2: 103-117.
13. Cowen, David J. 2008 “The Availability of Geographic Data: The Current Technical and Institutional Environment.” In *The Handbook of Geographic Information Science,* edited by Wilson, John P. and A. Stewart Fotheringham, 11-34. Oxford: Blackwell Publishing.
14. Lees, Brian G. 2008. “Remote Sensing.” In *The Handbook of Geographic Information Science,* edited by Wilson, John P. and A. Stewart Fotheringham, 49-60. Oxford: Blackwell Publishing.
15. Martin, David J. 2008. “Social Data.” In *The Handbook of Geographic Information Science,* edited by Wilson, John P. and A. Stewart Fotheringham, 35-59. Oxford: Blackwell Publishing.
16. Graham, Stephen E. and Thomas McCurdy. 2004. “Developing Meaningful Cohorts for Human Exposure Models.” *Journal of Exposure Analysis and Environmental Epidemiology* 14: 23-43.
17. Buzzelli, M., J. Su, B. Ainslie, D. Steyn, M. Brauer, and T. Larson. 2006. “A GIS Spatiotemporal Model of Ambient Air Pollution Exposure.” *Epidemiology* 17: S112-S118.
18. Goodchild, Micahel F. 2007. “Citizens as Voluntary Sensors: Spatial Data Infrastructure in the World of Web 2.0.” *International Journal of Spatial Data Infrastructures Research* 2: 24-32.
19. Johnson, Chris E., and Christopher C. Barton. 2004. “Where in the World are My Field Plots? Using GPS Effectively in Environmental Field Studies.” *Frontiers in Ecology and the Environment* 2, no. 9 (November): 475-482.
20. Mavoa, Suzanne, Melody Oliver, Karen Witten, and Hannah M. Badland. 2011. “Linking GPS and Travel Diary Data Using Sequence Alignment in a Study of Children's Independent Mobility.” *International Journal of Health Geographics* 10: 64.
21. Nuvolone, Daniela, Roberto della Maggiore, Sara Maio, Roberto Fresco, Sandra Baldacci, Laura Carrozzi, Francesco Pistelli, and Giovanni Viegi. 2011. “Geographical Information System and Environmental Epidemiology: A Cross-Sectional Spatial Analysis of the Effects of Traffic-Related Air Pollution on Population Respiratory Health.” *Environmental Health* 10: 12.
22. Zielstra, Dennis, and Hartwig H. Hochmair. 2011a. “A Comparative Study of Pedestrian Accessibility to Transit Stations Using Free and Proprietary Network Data.” *Transportation Research Record* 2117: 145-152.
23. Zielstra, Dennis, and Hartwig H. Hochmair. 2011b. “Digital Street Data: Free Versus Proprietary.” *GIM International* 25: 29-33.
24. Brunsdon, Chris. 2008. “Inference and Spatial Data.” In *The Handbook of Geographic Information Science,* edited by Wilson, John P. and A. Stewart Fotheringham, 337-351. Oxford: Blackwell Publishing.

25. Brunsdon, Chris, A. Stewart Fotheringham, and Martin E. Charlton. 1996. "Geographically Weighted Regression: A Method for Exploring Spatial Non-stationarity." *Geographical Analysis* 28, no. 4 (October): 281-289
26. Mennis, Jeremy. 2006. "Mapping the Results of Geographically Weighted Rregression." *Cartographic Journal* 43, no. 2 (July): 171-179.
27. Patterson, Lauren, Marie Urban, Aaron Myers, Budhendra Bhaduri, Eddie Bright, and Phillip Coleman. 2007. "Assessing Spatial and Attribute Errors in Large National Datasets for Population Distribution Models: A Case Study of Philadelphia County Schools." *GeoJournal* 69, no. 1-2 (June): 93-102.
28. Tatalovich, Zaria, John P. Wilson, and Myles Cockburn. 2006. "A Comparison of Thiessen Polygon, Kriging, and Spline Models of Potential UV Exposure." *Cartography and Geographic Information Science* 33, no. 3: 217-231.
29. Brown, Daniel G., and Jiunn-Der Duh. 2004. "Spatial Simulation for Translating from Land Use to Land Cover." *International Journal of Geographical Information Science* 18, no. 1: 35-60.
30. Jarvis, Claire H., and Neil Stuart. 2001a. "A Comparison Between Strategies for Interpolating Maximum and Minimum Daily Air Temperatures. Part I: The Selection of "Guiding" Topographic and Land Cover Variables." *Journal of Applied Meteorology* 40, no. 6 (June): 1060-1074.
31. Jarvis, Claire H., and Neil Stuart. 2001b. "A Comparison Between Strategies for Interpolating Maximum and Minimum Daily Air Temperatures. Part II: The Interaction Between Number of Guiding Variables and the Type of Interpolation Method." *Journal of Applied Meteorology* 40, no. 6 (June): 1075-1084.
32. Hutchinson, M.F. 1989. "A New Procedure for Gridding Elevation and Stream Data with Automatic Removal of Spurious Pits." *Journal of Hydrology* 106, no. 3-4 (April): 211-232.
33. Ford, Andrew. 2009. *Modeling the Environment.* 2nd ed. Washington: Island Press.
34. Railsback, Steven F., and Volker Grimm. 2012. *Agent-Based and Individual-Based Modeling: A Practical Introduction.* Princeton: Princeton University Press.
35. Briggs, David. 2005. "The Role of GIS: Coping with Space (and Time) in Air Pollution Exposure Assessment." *Journal of Toxicology and Environmental Health A* 68: 1243-1261.
36. Jerrett, Michael, Altaf Arain, Pavlos Kanaroglou, Bernardo Beckerman, Dimitri Potoglou, Talar Sahsuvaroglu, Jason Morrison, and Chris Giovis. 2005. "A Review and Evaluation of Intraurban Air Pollution Exposure Models." *Journal of Exposure Analysis and Environmental Epidemiology* 15: 185-204.
37. Kanarogloua, Pavlos S., Michael Jerrett, Jason Morrison, Bernardo Beckerman, Altaf Arain, Nicolas L. Gilbert, Jeffery R. Brook. 2005. "Establishing an Air Pollution Monitoring Network for Intra-urban Population Exposure Assessment: A Location-Allocation Approach." *Atmospheric Environment* 39, no. 13 (April): 2399-2409.
38. Moore, D.K., Michael Jerrett, W.J. Mack, and N. Künzli. 2007. "A Land Use Regression Model for Predicting Ambient Fine Particulate Matter Across Los Angeles, California." *Journal of Environmental Monitoring* 9: 246-252.

39. Pastor, Manuel, Jim Sadd, and Rachel Morello-Frosch. 2004. “Waiting to Inhale: The Demographics of Toxic Air Releases in 21st Century California.” *Social Science Quarterly* 85, no. 2 (June): 420-440.
40. Cockburn, Myles G., Paul Mills, Xinbo Zhang, John Zadnick, Dan Goldberg, and Beate Ritz. 2011. “Prostate Cancer and Ambient Pesticide Exposure in Agriculturally Intensive Areas in California.” *American Journal of Epidemiology* 173, no. 11 (June): 1280-1288.
41. Goldberg D W, Zhang X, Marusek J C, Wilson J P, Ritz B, Cockburn M G 2007 Development of an Automated pesticide Exposure Analyst for California's Central Valley. In *Proceedings of the Urban and Regional Information Systems Association GIS in Public Health Conference,* New Orleans, Louisiana: 136-56 (available at http://dwgold.com/Conferences/Proceedings/urisaHealth2007.pdf)
42. Jaga, Kushik, and Chandrabhan Dharmani. 2005. “The Epidemiology of Pesticide Exposure and Cancer: A Review.” *Reviews on Environmental Health* 20, no. 1 (January): 15-38.
43. Marusek, Jennifer C., Myles G. Cockburn, Paul Mills, and Beate Ritz. 2006. “Control Selection and Pesticide Exposure Assessment via GIS in Prostate Cancer Studies.” *American Journal of Preventive Medicine* 30, no 2S: S109-S116.
44. Wang, Anthony, Sadie Costello, Myles G. Cockburn, Xinbo Zhang, Jeff Bronstein, and Beate Ritz. 2011. “Parkinson's Disease Risk from Ambient Exposure to Pesticides.” *European Journal of Epidemiology* 26, no. 7 (July): 547-555.
45. Boulton, Geoffrey, Michael Rawlins, Patrick Vallance, and Mark Walport. 2011. “Science as a Public Enterprise: The Case for Open Data.” *The Lancet* 377, no. 9778 (May): 1633-1635.
46. de Vos, Martine G., S.J.C. Janssen, L.G.J. van Bussel, J. Kromdijk, J. van Vliet, and J.L. Top. 2011. “Are Environmental Models Transparent and Reproducible Enough?” In *Proceedings of Nineteenth International Congress on Modeling and Simulation,* Perth, Australia: 2954-2961.
47. van der Sluijs, Jeroen P. 2002. “A Way Out of the Credibility Crisis of Models Used in Integrated Environmental Assessment.” *Futures* 34, no. 2 (March): 133-146.
48. Alexandrov, G.A., D. Ames, G. Bellocchi, M. Bruen, N. Crout, M. Erechtchoukova, A. Hildebrandt, F. Hoffman, C. Jackisch, P. Khaiter, G. Mannina, T. Matsunaga, S.T. Purucker, M. Rivington, L. Samaniego. 2011. “Technical Assessment and Evaluation of Environmental Models and Software: Letter to the Editor.” *Environmental Modeling and Software* 26: 328-336.
49. Jakeman, A.J., R.A. Letcher, and J.P. Norton. 2006. “Ten Iterative Steps in Development and Evaluation of Environmental Models.” *Environmental Modeling and Software* 21, no. 5 (May): 602-614.
50. Schmolke, Amelie, Pernille Thorbek, Peter Chapman, and Volker Grimm. 2010a. “Ecological Models and Pesticide Risk Assessment: Current Modeling Practice.” *Environmental Toxicology and Chemistry* 29, no. 4 (April): 1006-1012.

51. Schmolke, Amelie, Pernille Thorbek, Donald L. DeAngelis, and Volker Grimm. 2010b. "Ecological Models Supporting Environmental Decision Making: A Strategy for the Future." *Trends in Ecology and Evolution* 25, no 8 (August): 479-486.

Description and Assessment of Assignments

Students must participate in class discussion on a regular basis, prepare written assignments in the form of weekly briefs and model reports, and complete team projects and presentations.

Class Participation (17%): A class participation grade for the semester will be assigned based upon how actively students engage in the course. Students will be required to read all material outlined for each week of the course, and be prepared to lead and participate in group discussions about the readings in class. Failure to attend or to be adequately prepared to discuss the readings will lead to the assignment of a lower grade for that week. Students should also maintain a written log of insights and observations from the classroom discussions and accompanying homework projects that will assist in completing the final project.

Weekly Briefs (13%): Each week students will use the Blackboard Discussion Forum to respond to an assigned article or critique one of their own choosing. These electronic commentaries are for sharing among the class, and the overall quality of the contributions will be considered in the semester evaluation. To help simulate discussion, each student should comment on at least one other student's critique each week.

Model Reports (25%): Written reports will be assigned regularly to document steps in model formulation and/or to reflect upon assigned readings. Different criteria will be specified for model construction and deconstruction.

Class Presentation (15%): Students will be divided into 2-4 groups (depending on class size) and these groups will conduct a seminar on a topic determined in consultation with the instructor in the second half of the classes scheduled in Weeks 10 and 11. A one-page summary will be distributed in advance of the class itself and the topic may be an evaluation of a model or software (Caline, RePast, etc.), a complex systems subject (fractals, modifiable areal unit problems, neural networks, etc.) or some specific technique or application that is relevant but not otherwise covered in the course.

Team Project (30%): In the second half of the course, students will work in teams on projects determined in consultation with the instructor. The team will construct a spatial model to address some geographically relevant health problem. The final report and class presentation will summarize insights from each phase of the modeling process as experienced in the problem context.

Grading Breakdown

Assessment	Number	Points Each	% of Grade
Class Participation	17	1	17
Weekly Briefs	13	1	13
Model Reports	5	5	25
Class Presentation	1	15	15
Team Project	1	30	30
Total	35	-	100

Assignment Submission Policy

Assignments will be submitted for grading via Blackboard using the due dates specified in the Course Schedule below.

Additional Policies

Students are expected to attend and participate in every class session and to complete and upload all assignments before the deadlines detailed in the Course Schedule. Late work will be assessed a penalty of 10% per day and zero grades will be assigned for work that is more than one week late.

Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	**Readings**	**Deliverables/Due Dates**
Week 1 1/8	**Introduction to Class:** Brief introductions coupled with a discussion of class goals, projects, technology, reading assignments.		No deliverables.
Week 2 1/16* Monday, 1/15 is a university holiday	**GIS as a Modeling Platform:** A discussion of the various ways in which space and time are conceptualized in geographic information systems and used in spatial models of selected social and environmental processes.	Brimicombe (2010) Ch. 2 Cooke et al. (2006) Miranda et al. (2002, 2011) O'Sullivan & Perry (2013) Skidmore (2002) Ch. 1	Submit briefs by 5 p.m. on Wed, 1/17. Comments due by 10 a.m. on Fri, 1/19.

Week 3 1/22	**GIS Representation Options:** A discussion of the various ways in which social and environmental features are conceptualized and treated as objects and fields in geographic information systems and the challenges that are encountered representing time in GIS-based spatial models.	Gold (2006) Goodchild (2011) Goodchild et al. (2007) Stewart et al. (2013) Wilson & Burrough (1999)	Submit briefs by 5 p.m. on Wed, 1/24. Comments due by 10 a.m. on Fri, 1/26.
Week 4 1/29	**Legacy GIS Datasets:** A discussion of the methods used to construct and revise a variety of GIS-based social and environmental datasets that offer national and occasionally global coverage.	Bhaduri et al. (2007) Cowen (2008) Lees (2008) Martin (2008) Graham et al. (2004) Skidmore (2002) Ch. 3	Submit briefs by 5 p.m. on Wed, 1/31. Comments due by 10 a.m. on Fri, 2/2.
Week 5 2/5	**New GIS Data Sources:** A discussion of some of the new data sources and the types of processing that must be performed to yield useful information and/or to use them with other kinds of digital data in spatial models.	Buzzelli et al. (2006) Goodchild (2007) Johnson & Barton (2004) Mavoa et al. (2011) Nuvolone et al. (2011) Skidmore (2002) Ch. 2 Zielstra & Hochmair (2011a, b)	Submit briefs by 5 p.m. on Wed, 2/7. Comments due by 10 a.m. on Fri, 2/9.
Week 6 2/12	**Measurement, Calibration, & Validation:** An introduction to the special challenges and issues that are confronted when using GIS tools to describe and model place-based exposures and the spatial distributions of phenomena of interest.	Brimicombe A (2010) Ch. 8 Brunsdon (2008) Brunsdon et al. (1996) Mennis (2006) Patterson et al. (2007) Tatalovich et al. (2006)	Submit briefs by 5 p.m. on Wed, 2/14. Comments due by 10 a.m. on Fri, 2/16. Model report #1 due by 5 p.m. on Fri, 2/16.
Week 7 2/20* Monday, 2/19 is a university holiday	**Model Elements I (Spatial Patterns & Processes):** A discussion of some of the ways forces of attraction and segregation, individual mobile entities, and processes of spread are featured in models of social and environmental systems.	Brimicombe (2010) Ch. 9 Brown & Duh (2004) Jarvis & Stuart (2001a, b) Hutchinson (1989)	Submit briefs by 5 p.m. on Wed, 2/21. Comments due by 10 a.m. on Fri, 2/23. Model report #2 due by 5 p.m. on Fri, 2/23.

Week 8 2/26	**Model Elements II (Stocks & Flows):** A discussion of the various ways stocks accumulate and flows occur in time and the mathematical modeling protocols used for stocks (integrals) and flows (differentials).	Ford (2009)	Submit briefs by 5 p.m. on Wed, 2/28. Comments due by 10 a.m. on Fri, 3/2. Model report #3 due by 5 p.m. on Fri, 3/2.
Week 9 3/5	**Model Elements III (Agents):** A discussion of some of the ways which agents have been used to represent mobile individuals in dynamic models of human and environmental systems, and how complex system dynamics may be agent/individual-based or differential equation-based or both.	Railsback & Grimm (2012)	Submit briefs by 5 p.m. on Wed, 3/7. Comments due by 10 a.m. on Fri, 3/9. Model report #4 due by 5 p.m. on Fri, 3/9.
Week 10 3/19	**Modeling Process I (Guiding Principles):** A discussion of the tasks that will need to be completed as a part of a typical modeling workflow.	Ford (2009) O'Sullivan & Perry (2013)	Submit briefs by 5 p.m. on Wed, 3/21. Comments due by 10 a.m. on Fri, 3/23. Presentation summary due by 10 a.m. on Fri, 3/23. In-class presentations (3/26).
Week 11 3/26	**Modeling Process II (Air Pollution Examples):** An introduction to some of the ways spatial modeling has been used to characterize one or more forms of air pollution exposure.	Briggs (2005) Jerrett et al. (2005) Kanarogloua et al. (2005) Moore et al. (2007); Pastor et al. (2004)	Submit briefs by 5 p.m. on Wed, 3/29. Comments due by 10 a.m. on Fri, 3/31. Presentation summary due by 10 a.m. on Fri, 3/31. In-class presentations (4/2).
Week 12 4/2	**Modeling Process III (Pesticide Exposure Examples):** An introduction to some of the ways spatial modeling has been used to characterize one or more forms of pesticide exposure.	Cockburn et al. (2011) Goldberg et al. (2007) Jaga & Dharmani (2005) Marusek et al. (2006) Wang et al. (2011)	Submit briefs by 5 p.m. on Wed, 4/4. Comments due by 10 a.m. on Fri, 4/6.

Week 13 4/9	**Modeling the Modeler:** Discuss the human element of modeling and how this can be captured and passed from the model developer to a variety of users and use cases.	Boulton et al. (2011); De Vosa et al. (2013); Ford (2009); Van der Sluijs (2002)	Submit briefs by 5 p.m. on Wed, 4/11. Comments due by 10 a.m. on Fri, 4/13. Model report #5 due by 5 p.m. on Fri, 4/14.
Week 14 4/16	**The Art of Modeling:** Discuss the various features of successful modeling applications, including the need for authenticity, parsimony, transparency, and patience.	Alexandrov et al. (2011) Ford (2009) Jakeman et al. (2006) Schmolke et al. (2010a, b)	Submit briefs by 5 p.m. on Wed, 4/18. Comments due by 10 a.m. on Fri, 4/20.
Week 15 4/23	**Final Presentations:** Students will present their team projects, summarizing the insights garnered from each phase of the modeling process as experienced in their specific problem context.		Team project presentations
FINALS PERIOD 5/2 – 5/9			Final team report due by 5 p.m. on Fri, 5/5.

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs
Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.
Provides overall safety to USC community. dps.usc.edu

Resources for Online Students

The Course Blackboard page and the GIST Community Blackboard page have many resources available for distance students enrolled in our graduate programs. In addition, all registered students can access electronic library resources through the link https://libraries.usc.edu/. Also, the USC Libraries have many important resources available for distance students through the link: https://libraries.usc.edu/faculty-students/distance-learners. This includes instructional videos, remote access to university resources, and other key contact information for distance students.