Solar Energy, System Designs

ME-519WS/MT-528WS
2022 Fall Semester

Instructor: Charles Cohn
Course Web Address: https://sit.instructure.com/courses/35204/modules
Course Schedule: Monday-Sunday
Contact Info: Canvas e-mail or charlescohn17@yahoo.com, Tel. 973-696-4611
Virtual Office Hours: Any time during the week, 9:00am – 5:00pm
Recommended Prerequisite(s): ME/MT-518 Course
Corequisite(s): None
Cross-listed with: MT-528WS

COURSE DESCRIPTION

This course provides an in-depth treatment of how to transfer the latest solar thermal and photovoltaic technologies available to real world applications. It takes the student through the various phases of development of a solar space heating and photovoltaic integrated building; review occupant's requirements, site analysis, design concept, solar system design, cost estimates, building design, performance predictions and construction. The emphasis of the class is on solar system design methods, economic optimization of solar systems and installation. The class will also work on a project that will reflect real life consulting tasks by performing a design study of a Solar Photovoltaic or Thermal System. The course draws upon many interdisciplinary sources for information. It is assumed that those taking the course have an understanding of physics, chemistry, mathematics, thermodynamics and heat transfer. It would also be helpful if the student had first taken the "Solar Energy, Theory and Applications" (ME/MT-518) course.

STUDENT LEARNING OUTCOMES

At the successful completion of this course, the student will be able to:

- Determine azimuth and altitude angles of the sun by calculation or using a sun chart.
- Identify module tilt angle and orientation that provides maximum energy production.
- Identify the different types of PV Modules, thermal collectors, system components and materials used in the systems and determine their appropriate applications.
- Calculate the "heat loads" of buildings and analyze hot water loads.
- Compare different types of passive/active thermal systems and their advantages and disadvantages.
- Identify data required and size/design PV and passive/active Thermal Systems.
- Calculate PV System performance using the online PVWatts tool.
- Identify the economic and non-economic benefits of the solar systems.
- Perform energy audits of residential and commercial buildings and identify cost effective opportunities for energy savings.
- The overall goal of this course is to prepare the student to work independently or with architects in designing solar heated systems, as well as photovoltaic systems, for residential and commercial buildings.

At the completion of each lecture, the student will be able to:

Lecture #1 Define the behavior of solar radiation, including its measurement and calculate the various solar angles, such as: altitude, azimuth, zenith and incident angles. Calculate the hourly/daily solar radiation on tilted surfaces.

Define "Peak Sun Hours" and know how to use it in calculating the daily energy output of PV Modules.

Define "Solar Time" and know how to calculate it, as well as knowing the deviation between magnetic and True South directions for any location around the globe.

Map the hourly position of the sun for any latitude and day of the year. This will be later used to find the effects of any shadow, that may be created by an obstacle around the solar modules.

Lecture #2 Calculate the "Heat Load" of residential and commercial buildings using R-values of various building cross sections, air film resistances and heat losses by air infiltration. Identify the heat losses of a building prior to designing a solar heating system.

Lecture #3 Determine the pressure drops in air ducts and pipes and identify the blower or pump to be used for a given solar heating system design.

Lecture #4 Identify and describe the various types of passively heated buildings that exist and calculate their monthly and annual thermal performances. Describe the features of a Net Zero Energy Home.

Lecture #5 Identify and describe the various types of solar domestic hot water systems and calculate their thermal performances using the "f" chart.

Lecture #6 Identify and describe different photovoltaic (PV) systems. Size and design a PV System. Understand the role of PV generated electricity in reducing the carbon footprint.

Lecture #7 Identify and describe basic functions of different photovoltaic (PV) components that make up a Solar PV system, such as: PV modules, inverters and charge controllers. Identify data required to size and design a grid connected PV System. Describe the advantages and disadvantages of different energy storage systems. Identify common PV module mounting options and compare their advantages and disadvantages.

Lecture #8 Compare various types of solar powered water pumps and their performance under various types of applications. Calculate a solar water pumping system for a farm. Define the thermal process and membrane technology of solar desalination.

Lecture #9 Define the theory, design considerations and installation strategies necessary to install and maintain a solar domestic hot water system.

Lecture #10 Balance the need of conservation vs. sizing a solar system. Identify the various types of computer software that is available for determining the performance of solar heating and PV systems. Calculate the PV System performance using the online PVWatts tool.

Lecture #11 Understand the fundamental procedure in dealing in the economics of money. Develop system sizing and project cost estimates and calculate the payback period and life cycle costing of a solar heating or PV system. Identify the benefits of a solar system.

Lecture #12 Identify the various types of energy audits of buildings and how to perform them. Identify the test equipment used in an audit and the opportunities that exist in saving energy in a residential or commercial building.

COURSE FORMAT AND STRUCTURE

This course is fully online. To access the course, please visit stevens.edu/canvas . For more information about course access or support, contact the Technology Resource and Assistance Center (TRAC) by calling 201-216-5500.

Course Logistics

Every week you should complete the following:

Study the Power-Point slides for that week, shown in Canvas.

Supplement your reading on the subject utilizing the textbooks and recommended references.

The homework is normally assigned on Mondays, unless it falls on a holiday, then it is assigned on a Tuesday and is due a week later, on

Monday (not later than 12:00am EST). The homework should be typed and sent to the professor in **WORD** by Canvas e-mail. The weekly assignments will be graded, and grades posted within 48 hours after receiving everyone's homework.

To encourage the student to stay on schedule; 20% of the total points will be deducted for assignments received 1-3 days late; assignments received more than 3 days late will receive 0 points.

Instructor's Online Hours

I will be available via email and will respond as soon as I am available (generally within 24-48) hours.

Online Etiquette Guidelines

Your instructor and fellow students wish to foster a safe online learning environment. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an idea but you are not to attack an individual. Our differences, some of which are outlined in the University's inclusion statement below, will add richness to this learning experience. Please consider that sarcasm and humor can be misconstrued in online interactions and generate unintended disruptions. Working as a community of learners, we can build a polite and respectful course ambience. Please read the Netiquette rules for this course:

- Do not dominate any discussion. Give other students the opportunity to join in the discussion.
- Do not use offensive language. Present ideas appropriately.
- Be cautious in using Internet language. For example, do not capitalize all letters since this suggests shouting.
- Avoid using vernacular and/or slang language. This could possibly lead to misinterpretation.
- Keep an "open-mind" and be willing to express even your minority opinion.
- Think and edit before you push the "Send" button.
- Do not hesitate to ask for feedback.

TENTATIVE COURSE SCHEDULE

	Week starting on:	
Lecture 1	Thursday, September 1, 2022	
Lecture 2	Tuesday, September 6, 2022	
Lecture 3	Monday, September 12, 2022	
Lecture 4	Monday, September 19, 2022	
Lecture 5	Tuesday, September 27, 2022	
Lecture 6	Monday, October 3, 2022	
Mid-Term Test Posted	Tuesday, October 11, 2022	
Lecture 7	Monday, October 17, 2022	Mid-Term Test Due
Lecture 8	Monday, October 24, 2022	
Lecture 9	Monday, October 31, 2022	
Lecture 10	Monday, November 7, 2022	

Lecture 11	Monday, November 14, 2022
Thanksgiving Recess	Monday, November 21, 2022
Lecture 12	Monday, November 28, 2022
Final Test Posted	Monday, December 5, 2022
	Monday, December 12, 2022 Final Test Due

Note: The dates shown above start and end on Eastern Standard Time (EST)

COURSE CONTENT

Lecture	Topic	Description
1	Review the Principles of Solar Radiation	• The Nature of Solar Radiation • Radiation on Earth's Surface ➢ Types of Solar Radiation ➢ Measurement of Solar Radiation ➢ Extraterrestrial/Terrestrial Solar Radiation • Hourly/Daily Solar Radiation on Tilted Surfaces • Peak Sun-Hours/Day • Solar and Local Standard Time • Isogonic Chart Sun Path Diagrams
2	Heating Load Calculations	• Heat Transmission Through Building Materials • R-value Calculations for Various Building Cross Sections ➢ Thermal Resistances Through Windows ➢ Heat Loss Calculations for At-Grade Slab Floors ➢ Thermal Resistances for Below Grade Basement Walls and Doors ➢ Indoor and Outdoor Air Film Surface Thermal Resistances ➢ Thermal Resistance of Air Spaces ➢ Heat Losses by Infiltration • Temperature of Unheated Attic • Comparison of Heating Load Calculations vs. Actual Building Heat Losses • Example of Heat Load Calculations of a Residential Building
3	Pressure Drop in Ducts and Piping	• Definition of Pressure Drop • Calculating Pressure Drop in Ducts ➢ Bernoulli's Equation ➢ Fluid Resistance ❖ Friction Losses ✓ Darcy and Colebrook Equation ✓ Roughness Factor ✓ Friction Chart ✓ Non-circular Ducts ✓ Rectangular Ducts ❖ Dynamic Losses ✓ Local Loss Coefficient ➢ Fan Inlet and Outlet Conditions ➢ Losses in Multiple Fittings ➢ Selecting a Blower • Ductwork Design • Calculating Pressure Drop in Pipes ➢ Friction Losses

		❖ The Darcy – Weisbach Equation ➢ Valve and Fitting Losses ❖ Start of Class Project
4	Performance Analysis of Passively Heated Buildings	• Introduction to Passive Solar Technology • Types of Passive Heating Systems ➢ Direct Gain Systems ➢ Indirect Gain Systems ❖ Attached Green House ❖ Masonry and Water Thermal Storage Wall ➢ The Passive Hybrid System • Introduction to the Solar Load Ratio (SLR) Method • Correlation Techniques • The SLR Method Applied to Passive Heating Systems • Solar Radiation Correlations • Shading and Other Considerations • Design Analysis vs. Performance Predictions • Deciding Between Conservation and Passive Solar Options • Performance Analysis Examples • Example of a Net Zero Energy Home
5	Determining Active Solar System Thermal Performance	• Introduction to Active Solar Heating Performance Predictions • Introduction to the f-chart Method • Identification of Dimensionless System Variables • Active Domestic Solar Hot Water Heating • The “f-chart” for Domestic Hot Water Heating Systems • Finding $F_R(\tau\alpha)$ and $F_R U_C$ • Deviations From Nominal Values Used in “f-chart” ➢ Collector Liquid Fluid Flow Rate ➢ Storage Capacity ➢ Collector to Storage Heat Exchanger Performance • Examples of System Performance Calculations
6	Solar Photovoltaic Systems	• Photovoltaic System Types ➢ Direct-Coupled PV System ➢ PV System with Battery Storage Powering DC Loads • Stand-Alone PV System with Battery Storage Powering • DC and AC Loads ➢ Grid-Connected Solar Photovoltaic System ➢ Solar Photovoltaic Hybrid System • PV System Design • Series and Parallel Circuit Connections of PV Modules • Typical PV Module Specifications • A Sampling of Photovoltaic Systems
Midterm exam		
7	PV System Components	• Monofacial PV Modules • Common Types Of PV Modules ❖ Solar Photovoltaics – Basic Principles ❖ Solar Cell Fabrication Process • Factors Affecting Module Performance • Module Performance ❖ The I-V Curve • Bifacial PV Modules

		• Charge Controllers
		• String Inverters / Micro Inverters
		• Mounting Hardware
		• Solar and Wind Energy Storage
		    ➢ Batteries
		    ➢ Reversible Fuel Cells (FC)
		    ➢ Super-conducting Magnetic Energy Storage (SMES)
		    ➢ Compressed Air Energy Storage (CAES)
		    ➢ Flywheels (FW)
		    ➢ Pumped Hydro Storage (PHS)
		    ➢ Thermal Energy Storage (TES)
		• Air Pollution Effects on Soiling and Cleaning of Photovoltaic Panels
		• Cost of Solar PV
		    ➢ Rooftop vs. Utility Scale PV Generation Costs
		• Rooftop or Utility Scale PV Generation?

8.1
 	
8.2
	Solar Powered Water Pumping
	
	Solar Desalination
		• Drinking, Irrigation and Livestock Water Pumping Systems
		• Solar Water Pumps
		• PV Application
		    ➢ System Types
		    ➢ Power Requirements for Pumping Water System Design
		• Example of Solar Thermal Power Irrigation Pumping
		• Thermal Processes
		• Membrane Technologies

9	Solar Domestic Hot Water (DHW) Installation	• Start-up • System Siting • System Layouts • Roof Mounting Procedures • Piping • Component Selection - Valves, Gauges and Expansion Tanks • Selecting a DHW Circulating Pump • Storage Tanks • Insulation • Heat Transfer Fluids • System Controls • Example of a Solar DHW Installation
10.1 10.2	Balancing Conservation and Solar Computer Software Available for Solar System Performance Calculations	• Introduction, Conservation vs. Solar • Conservation Formulas • Determining the Conservation Factor (CF) • Design Procedure • Examples of Determining the Optimum Conservation vs. Solar • The Role of Simulation Analysis • Software Availability • Program Types Available • On-Line Resources
11	Solar Energy Economics	• Economic Feasibility Studies • Payback Period • Detailed Economic Analysis Method ➢ Solar System Life Cycle Costs

		✓ Solar System Initial Costs ✓ Solar System Future Costs ✓ Annualized Solar Costs • Case Study ➢ Economic Analysis for the PV System at the Community Presbyterian Church in Ringwood, NJ
12	Special Topic – Energy Audits of Buildings	• Introduction • What is an Energy Audit? • The Science of Energy • Typical Steps in an Energy Audit • Test Equipment Used in an Energy Audit • Energy Consumption in Buildings • A Sampling of Energy Saving Opportunities in Buildings • Considering Renewable Energy for Supplementing the Energy Needs of a Building
	Final exam	

COURSE MATERIALS

Required Textbooks: Textbook #1
"Principles of Solar Engineering"
by D. Yogi Goswami, 3rd ed., Taylor & Francis, 2015
ISBN-13: 978-1-4665-6378-0

Textbook #2
"Electricity from Sunlight, an Introduction to Photovoltaics"
by Paul A. Lynn, John Wiley & Sons Ltd., 2012
(Available ONLINE at the Stevens Library)

Additional material on the subjects being discussed, is provided to students via PowerPoint slides.

Recommended Books to Acquire: **"Passive Solar Design Handbook" - Volume 3**
Prepared for U.S. Department of Energy
J. Douglas Balcomb, Los Alamos National Laboratory,
Robert W. Jones, Editor , DOE/CS-0127/3, July 1982

"Photovoltaics, Design and Installation"
Solar Energy International
New Society Publishers, 5th Printing, April 2010

References: **"Fundamentals of Heat and Mass Transfer"** by Frank P. ncropera and David P. DeWitt, John Wiley & Sons, Inc., 6th Ed., 2006

"Solar Heating and Cooling" by John F. Kreider and Frank Kreith, 2nd ed., Hemisphere Publishing Corp, 1982

"The Passive Solar Energy Book" by Edward Mazria,
Rodale Press, 1979

"Solar Heating Design by the f-Chart Method"

William A Beckman, Sanford A. Klein & John A. Duffie
John Wiley & Sons, 1977

"2009 ASHRAE Handbook – Fundamentals" (Inch-Pound Ed.)
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (Stevens E-book on line)

"Passive Solar Design Handbook" - Volume 3 of 3
Prepared for U.S. Department of Energy
J. Douglas Balcomb, Los Alamos National Laboratory, Robert W. Jones, Editor , DOE/CS-0127/3, July 1982

" Passive Solar Design Handbook" - Volume 2 of 3
Prepared for U.S. Department of Energy
J. Douglas Balcomb, Los Alamos National Laboratory
DOE/CS-0127/2, January 1980

"Photovoltaics, Design and Installation"
Solar Energy International
New Society Publishers, 5th Printing, April 2010

"**Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors"**
National Renewable Energy Laboratory, 1994

"**Solar Engineering of Thermal Processes"**
By John A. Duffie and William A. Beckman, 4th ed.
John Wiley & Sons, 2013

COURSE REQUIREMENTS

Homework: The homework is normally assigned on Mondays, unless it falls on a holiday, then it is assigned on a Tuesday and is due a week later, on Monday (not later than 12:00am EST). The homework should be submitted through the Assignment Tool within Canvas in **WORD.** The weekly assignments will be graded, and grades posted within 48 hours after receiving everyone's homework.

To encourage the student to stay on schedule; 20% of the total points will be deducted for assignments received 1-6 days late; assignments received more than 1 week late will receive 0 points.

Discussions: In those weeks that discussions are held, the student is expected to provide one unique response to the discussion topic and provide a substantive response to another student. Each student will be graded according to his/hers participation in the discussion.

Project: The class is to work on a project that will reflect real life consulting tasks, such as designing PV or Thermal Solar Energy Systems on buildings or mobile devices. The first half of each class consists of lectures on topics related to solar energy system designs and the second half is devoted to a real-life consulting project, which uses the knowledge gained from the first solar energy course and the lectures covered in this course. The students are assigned to work on various parts of the project, and their contributions are reflected in a final report. The Class Project will start after Lecture #3.

Exams: There is going to be a Mid Term Exam that will be held after completion of Lecture #6 and will cover Lectures #1 - #6. At the end of the semester there will be a Final Exam covering Lectures #1 - #12. The schedules for the above exams are shown above in “Tentative Course Schedule”. No retakes of exams are allowed.

TECHNOLOGY REQUIREMENTS

Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Canvas

Required Equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection

Required Software

- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint

GRADING PROCEDURES

Grades will be based on:

Homework – 30%
Mid-Term Exam – 30%
Final Exam – 40%

Late Policy

To encourage you to stay on schedule; 20% of the total points will be deducted for assignments received 1-6 days late; assignments received more than 1 week late will receive 0 points.

Academic Integrity

Undergraduate Honor System

Enrollment into the undergraduate class of Stevens Institute of Technology signifies a student's commitment to the Honor System. Accordingly, the provisions of the Stevens Honor System apply to all undergraduate students in coursework and Honor Board proceedings. It is the responsibility of each student to become acquainted with and to uphold the ideals set forth in the Honor System Constitution. More information about the Honor System including the constitution, bylaws, investigative procedures, and the penalty matrix can be found online at http://web.stevens.edu/honor/

The following pledge shall be written in full and signed by every student on all submitted work (including, but not limited to, homework, projects, lab reports, code, quizzes and exams) that is assigned by the course instructor. No work shall be graded unless the pledge is written in full and signed.

"I pledge my honor that I have abided by the Stevens Honor System."

Reporting Honor System Violations
Students who believe a violation of the Honor System has been committed should report it within ten business days of the suspected violation. Students have the option to remain anonymous and can report violations online at www.stevens.edu/honor.

Graduate Student Code of Academic Integrity

All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student's submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at www.stevens.edu/provost/graduate-academics.

Special Provisions for Undergraduate Students in 500-level Courses

The general provisions of the Stevens Honor System do not apply fully to graduate courses, 500 level or otherwise. Any student who wishes to report an undergraduate for a violation in a 500-level course shall submit the report to the Honor Board following the protocol for undergraduate courses, and an investigation will be conducted following the same process for an appeal on false accusation described in Section 8.04 of the Bylaws of the Honor System. Any student who wishes to report a graduate student may submit the report to the Dean of Graduate Academics or to the Honor Board, who will refer the report to the Dean. The Honor Board Chairman will give the Dean of Graduate Academics weekly updates on the progress of any casework relating to 500-level courses. For more information about the scope, penalties, and procedures pertaining to undergraduate students in 500-level courses, see Section 9 of the Bylaws of the Honor System document, located on the Honor Board website.

EXAM CONDITIONS

The following procedures apply to exams for this course. As the instructor, I reserve the right to modify any conditions set forth below by printing revised Exam Conditions on the exam.

1. Students may use the following materials during exams. Any materials that are not mentioned in the list below are not permitted.

Material	Permitted?	
	Yes	No
Handwritten Notes Conditions: i.e. size of note sheet	✓	
Typed Notes Conditions: i.e. size of note sheet	✓	
Textbooks Conditions: i.e. specific books	✓	
Readings Conditions: i.e. specific documents	✓	
Laptop	✓	

2. Students are not allowed to work with or talk to other students about exams.

LEARNING ACCOMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/office-disability-services. If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at pgehman@stevens.edu or by phone 201-216-3748.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

INCLUSIVITY

Name and Pronoun Usage

As this course includes group work and class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

Inclusion Statement

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

MENTAL HEALTH RESOURCES

Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues (e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression) and who can visit the office in person. CAPS is open from 9:00 am – 5:00 pm Mondays, Wednesdays, Thursdays and Fridays and from 9:00 am – 7:00 pm on Tuesdays during the Fall and Spring semesters; appointments are highly encouraged. For those students who cannot visit the Stevens campus for an in-person appointment, you can contact a local mental health care provider for an in-person appointment, or if you are enrolled in the Stevens Student Health Insurance, you may call Care Connect for 24/7 mental health support at 1-888-857-5462.

For further information please visit the CAPS webpage on Seeking Help Off-Campus.

EMERGENCY INFORMATION

In the event of an urgent or emergent concern about the safety of yourself or someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year round. For students who do not reside near the campus and require emergency support, please contact your local emergency response providers at 911 or via your local police precinct. Other 24/7 national resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text "Home" to 741-741). If you are concerned about the wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at care@stevens.edu. A member of the CARE Team will respond to your concern as soon as possible.