

SPACE WEATHER AND ENVIRONMENT (SWEN)

SWEN 571: 3 s.h.

The Origins of Space Weather

Phenomenological approach to understanding the origins of space weather and the space environment from the Sun to the Earth's surface including a detailed treatment of coronal holes, coronal mass ejections, sunspots, solar flares, solar energetic particle events, solar radio bursts, solar structure including its magnetic dynamo, solar wind, terrestrial magnetic field, geomagnetic storms. Prerequisite: admission to the program or permission of the program coordinator. 3 hrs. Fully online, distance-learning format. Offered annually.

SWEN 572: 3 s.h.

Impacts of Space Weather on the Technological World

Systems approach to understanding how space weather impacts the near-earth space environment, our magnetosphere, upper atmosphere, and the myriad of ways it couples into the Earth system. Identification and impact of solar radio bursts, geomagnetic storms, geomagnetically induced currents (GICs), aurora, and radiation storms on our technological infrastructure. The course will address the varying severity of impacts from mild inconveniences to the possibility of a Carrington-class event that could cause a massive geomagnetic storm that could destroy national power grids world-wide and cause irreparable damage to the global economy. 3 hrs. Prerequisite: SWEN 571 or permission of program coordinator. Fully online, distance-learning format. Offered annually.

SWEN 673: 3 s.h.

Effective Decision-Support for Space Weather Risks

Space weather data, products, and information is a vital component for effective decision-making process for relevant stakeholders. This course uses a case-studies approach to identify and document the most effective means of producing and delivering space-weather information including alerts, warnings, and notifications to target audiences and the general public, and to ensure that space-weather products are used intelligibly to inform decision making. Prerequisites: SWEN 572 or permission of program coordinator. 3 hrs. Fully online, distance-learning format. Offered annually.

SWEN 674: 3 s.h.

Space Weather Broadcast and Communications

Examines existing space weather data, images and products. These products will be important in learning how to create a space weather broadcast. Video projects pertaining to specific space weather events such as solar flares, geomagnetic storming, radiation storms, etc. will be important to demonstrate knowledge of which products to use for communicating a forecast. How to utilize resources, integrated space weather analysis system, solar dynamics observatory and others, will be stressed. Prerequisite: SWEN 572 or permission of the program coordinator. 3 c.h. Offered annually. Fully online, distance-learning format.