Composite Materials Engineering - Composites in a Material World

Instructor: Assistant Professor, Saeed Ziaee, Department of Composites Engineering

Combining two materials to build things has a long history. However, modern new fibers and polymers have created a revolution! Come and learn about how composite carbon fibers have enabled the creation of new building materials with high strength and stiffness, light weight and corrosion resistance. Through hands-on activities including a field trip, participants will learn how to make these composites, test them and discover how they are used in various products.

Anticipated Activities:

- tour of local composites company
- fabrication of composite materials
- testing of composite for strength and stiffness

Age Recommendation: 10-14 years

Physical Activity Level: Moderate; participants will need to climb stairs, be able to stand for periods of time and walk about ½ mile
Notes:

- latex gloves will be provided for lab work; inform instructor of allergies to latex on the first day of class;
- goggles will be provided for lab work;
- dress in casual, comfortable clothes and closed-toed shoes (no sandals or flip-flop shoes permitted in the lab); clothing and shoes may become lightly soiled with spatter and dust from handling composite materials;
- participants will be working with resins and fibers that produce some odors; inform instructor on the first day of class about any known allergic reactions or other health concerns that might result from mild exposure to composite resins for other materials.

**English - Our Family Stories**

Instructor: Professor Conan Kmiecik, Department of English

Over the course of a lifetime, an individual accumulates a multitude of stories about his/her formative experiences: love, heartbreak, triumph, setback, adventure or routine. Too often, however, they are not shared with or recorded by the successive generations. In this course grandparents and grandchildren will exchange stories, make a record of the stories, and then use a multimedia format to share their stories with extended family members.

**Anticipated Activities:**

- practicing interview skills
- learning how to write a profile
- experimenting with computerized presentation software (PowerPoint and Prezi)

**Age Recommendation:** 8-14 years

**Physical Activity Level:** Low

**Notes:** basic familiarity with computer keyboarding skills helpful.
Geosciences - The River of Mark Twain: WSU STaRS Flume Lab

Instructor: Professor Toby Dogwiler, Department of Geosciences

Course Description: Mark Twain’s classic novel, “Life on the Mississippi River” describes how as a river pilot he learned to “read the river.” In this course we will discuss the river processes at work in Twain's descriptions of the river’s sand bars, snags, and currents. The discussions will be complemented by hands-on investigations in Winona State University's STaRS (Sediment Transport and River Studies) Flume Lab. We will use WSU's eight "indoor" rivers to model and explore Twain's narratives and the science behind the story he tells.

Anticipated Activities:

- become familiar with Mark Twain's descriptions of navigating the Mississippi River system;
- use the WSU STaRS Flume Lab to model river processes;

Age Recommendation: 8-14 Years

Physical Activity Level: Low; some standing; special needs can be accommodated with prior notice.

Notes:

- dress in casual, comfortable clothes; shoes should have good traction; clothes and shoes may become damp while working in the flume lab
Health, Exercise & Rehabilitative Science—Good Health for You & Me

Instructor: Professor Nancy Jensen and the Faculty and Students of the Department of Health, Exercise and Rehabilitative Science (HERS)

Course Description: Come explore the inter-generational differences of food and exercise knowledge and habit. What DID people eat before Doritos were invented? How DID people gain muscle without a weight set? Just what IS a stability ball? See what science has done to the dunk tank. Participate in acceleration and deceleration of the aging process and enjoy everybody’s favorite topic: FOOD!

Anticipated Activities:

- tour of WSU Integrated Wellness Center and exercise physiology lab;
- simulations of aging across the life-span;
- nutrition knowledge bowl game;
- cooking for health

Age recommendation: 8-14 years

Physical Activity Level: Moderate; all participants are welcome, however participation in the physical exercise component of the course will require a moderate amount of physical exertion, mobility, strength and stamina.

Notes:

- dress in comfortable, loose-fitting clothing and closed-toe athletic shoes suitable for physical exercise;
- inform the instructor of any health related food allergies at the start of the course.
Physics - Pressure Can Be Fun

Instructor: Professor Edward Roberts, Department of Physics

We all live under “pressure”, but this can be a good thing! This class will explore the science behind the concept of “pressure” in a fun and interactive way. Test out your ideas about pressure through hands-on activities such rocket launching, wearing high heel shoes, floating a boat, flash-freezing objects and other interesting activities. Participants are certain to come away with a new understanding of the expression “living under pressure.”

Anticipated Activities:

- bottle rockets
- bed of nails
- high heels
- "chilling" with liquid nitrogen

Age Recommendation: 10-14 years

Physical Activity Level: low; average manual dexterity is helpful

Notes:

- safety goggles will be provided
- casual dress and closed-toe shoes are recommended