

TriAD Curricular Teams and Goals: Years 1 & 2

Systems Thinking and Engineering Basics

Freshman Year Team (strengths)
 Linda Vanasupa* (materials engineering/engineering education)-lead
 Richard Savage* (chemistry/systems engineering)
 Katherine Chen* (materials science/chemistry/education)
 Susan Ambrose (education/retention)
 Diane Long* (public policy)
 Julie Zimmerman (sustainability/water quality issues)

222-Materials selection and life cycle assessment
 Blair London* (Materials Engineering)-lead
 Katherine Chen* (Materials Science/Chemistry/Education)
 Richard Savage* (Chemistry/Systems Engineering)
 Linda Vanasupa* (Sustainability/Eng. education)
 Susan Ambrose (Education/Retention)
 Julie Schoenung (Sustainability/Materials)
 Barbara Schader* (Library Science)
 Jacqui Isaacs (Materials Science/Recycling processes)
 Dianne Long* (Political Science)
 Susan Robertson (Sustainable Materials for Architecture)
 Julie Zimmerman (Sustainability in Eng./Public policy)

232-Nanotech, biology, ethics and society
 Linda Vanasupa (Materials Engineering/Engineering Education) co-lead
 Matthew Ritter (Biology) co-lead
 Dianne Long (Political Science/Technology and public policy)
 Lynne Slivovsky (Electrical Engineering/Ethics)
 Peter Schwartz (Physics/Nanotechnology)
 Katherine Chen (Materials Science/Chemistry/Education)
 Richard Savage (Chemistry/Systems Engineering)
 Barbara Schader (Information Literacy/Library Science)
 Jacqueline Isaacs (Materials Science/Industrial Ecology/Ethics)

225 and 235-Materials Labs I and II
 Katherine Chen (Materials Science)
 Linda Vanasupa (Statistics/Data Acquisition)
 Victor Granados (Manufacturing/Metallography)

TriAD Freshman Lab Sequence

110 (1)	120 (1)	130 (1)
Fall	Winter	Spring
	Service learning-20 week design project	

Freshman TriAD course sequence, 3 quarters, 1 unit/quarter

TriAD Sophomore Lecture/Lab Sequence

210 (3)	222 (4)	232 (4)
Fall	Winter	Spring
215 (1)	225 (1)	235 (1)



- Freshman lab sequence**
- Orient students toward design
 - Engage in Service learning
 - Mastery
 - Integration of support subjects
 - Team building
 - Connection with peers
 - Forming learning communities
 - Reflection for Ethical and Societal Issues
 - Systems thinking



- 232 Course**
- explores societal and ethical themes
 - Develops tools for life-long learning
 - Exposes to emerging technologies
 - Strengthens critical thinking skills
 - Emphasizes systems thinking

- 235 Lab**
- Mastery in laboratory practices
 - Materials analysis techniques (metallography)
 - Application of statistics in measuring
 - Measurement/computer data acquisition

- 222 Course**
- explores the twelve principles of green engineering
 - presents cradle to cradle design v. cradle to grave design
 - practices the basics of life cycle assessment
 - uses software tools for selecting materials for low life cycle impact (*Cambridge Engineering Selector 4*)
 - compares closed loop product scenarios and impact on life cycle assessment
 - includes case studies for engineering and architecture
 - Touches on societal and political issues

- 225 Lab**
- Mastery in laboratory practices
 - Measurement/computer data acquisition
 - Strengthen basic materials science (crystal structure)
 - Recognition/exploration of manufacturing techniques (how things are made)
 - Application of statistics in measuring

TriAD Curricular Teams and Goals: Year 3 & 4

Faculty Development Team: *Junior and Senior years*
 Blair London* (Materials Engineering)
 Katherine Chen* (Materials Science/Chemistry/Education)
 Richard Savage* (Chemistry/Systems Engineering)
 Linda Vanasupa* (Materials Engineering/Sustainability) Barbara Schader* (Library Science)
 Susan Ambrose (Education/Retention)
 Dianne Long* (Political Science)
 Julie Schoenung (Life Cycle Assessment/Materials processing)
 Julie Zimmerman (Sustainability in Engineering/Public policy)

*Individuals from Cal Poly.

Junior Year: Application Driven Courses

- Courses scheduled in blocks (3-4 hours/day, 4 days/wk)
- Learning modules built around engineering applications
- Each Learning module may last several days
- Science integrated into engineering application
- Learning modules team-taught, team-learned

Candidate Junior Year Projects

- Adhesive properties of soft-tissue patches for hernias*
- Design of transition T for NiTi stent*
- Making fiber optic cable*
- Solution hardening of 6061 T6 bicycle crank*
- Forging coins*
- Creating surface hardness for a gear*
- Fabrication of MEMS device*
- Optimizing oxidation process for integrated circuits*
- Calibration of furnace*
- Fabrication of nanoparticle solar cell*
- Creation of polymer fuel cell
- Casting a space shuttle tile*
- Service learning*-Water purification* (multidisciplinary group)

*experiments that we have already piloted in some form

TriAD Junior Lecture/Lab Course Block Sequence

Fall	Winter	Spring
310 (3)	330 (3)	350 (3)
315 (1)	335 (1)	355 (1)
320 (3)	340 (3)	360 (3)
325 (1)	345 (1)	360 (1)

TriAD Senior Professional and Tech Elective Sequence

Fall	Winter	Spring
481 (1)		
482 (1)	483 (1)	484 (1)
<i>Senior Project Sequence</i>		
4xx (4)	4xx (4)	4xx (4)
4xx (4)	3xx - 4xx (4)	3xx - 4xx (4)
<i>Non-MATE Courses</i>		

Process Design and Control

- Practice design (materials engineering)
- Use of statistics for process control and design of experiments
- Mastery in applied engineering
- Integration of science in engineering practices
- Team building
- Connection with peers
- Forming learning communities
- Reflection for Ethical and Societal Issues
- Systems thinking
- Integration of ABET "other 7" design constraints
- Strengthening written communication
- Team-based learning
- Project-based learning
- Service learning

Guided Synthesis and Communication

- Practicing Professionalism
- Strengthening Oral Communication
- Developing time management skills
- Strengthening Independent thinking
- Continuing design practice
- Applying all ABET design constraints
- Engineering mastery

Professional Breadth and Depth

- Strengthening intellectual breadth
- Strengthening intellectual depth
- Strengthening written communication
- Strengthening life-long learning practices