

Selection List of Graduate Engineering Courses¹ **(This list to be updated every three years²; next update Fall 2017)**

1. BIOE 517 (MATSE 507) Biomaterials Surface Science (3): Special properties of surfaces as an important causative and mediating agent in the biological response to materials.
2. C E 551 Random Processes in Hydrologic Systems (3): Hydrologic systems analysis, simulation; design using probability, time series and dynamical systems; formulating models, parameter estimation, environmental impact, resource assessment.
3. C E 555 Groundwater Hydrology Analysis and Modeling (3): Introduction to groundwater resource analysis, model formulation, simulation, and design of water resource systems using symbolic and numerical methods.
4. CE 561 Surface Hydrology (3): Quantification of the processes that govern the movement and storage of water near the land-surface including precipitation, evapotranspiration, and runoff.
5. C E 564 Sediment Transport in Alluvial Streams (3): River flow, river channel formation, the physical characteristics of rivers, responses of rivers to natural and human-made changes.
6. C E 567 River Engineering (3): Introduction to river mechanics and fluvial geomorphology applied to problems of sediment transport and channel morphology.
7. C E 576 (CH E 576): Environmental Transport Processes (3) Fundamentals of chemical transport in engineered environments, such as biofilm reactors, and natural systems including aquifers and rivers.
8. CH E 524 Chemical Engineering, Application of Thermodynamics (3): Elements of thermochemistry and thermodynamics of greatest importance in chemical engineering.
9. CH E 535 Chemical Reaction Engineering (3): Optimal design of batch and continuous chemical reactors and reactor batteries; effect of mixing on reactor operation.
10. CH E 544, General Transport Phenomena (3): Formulation and solution of transport problems involving momentum, heat, and mass transfer, with chemical engineering applications.
11. CH E 597C, Membrane Separations and Transport (3): This course will focus on membrane separations fundamentals and applications primarily for aqueous separations. Low pressure, high pressure and electrically as well as osmotically driven membrane separations will be covered in detail. A module will cover biological membrane transport and modeling.
(To be replaced with the permanent number course when approved)
12. E MCH 507 Theory of Elasticity and Applications (3): Equations of equilibrium and compatibility; stresses and strains in beams, curved members, rotating discs, thick cylinders, torsion and structural members.

¹Other similar graduate engineering courses (5XX or 8XX) can be taken by petition

²Approved by ABE Graduate Faculty on September 9, 2014

13. M E 512 Heat Transfer: Conduction (3) One- and two-dimensional conduction heat transfer for steady state and transient systems with varying boundary conditions.
 14. M E 513 Heat Transfer: Convection (3) Laminar and turbulent flow heat transfer in natural and forced convection systems.
 15. M E 514 Heat Transfer: Radiation (3) Thermal radiation fundamentals; specular and diffuse systems; differential and integral methods; numerical techniques; industrial applications.
 16. SOILS 597A Unsaturated Zone Hydrology (3): Lecture, literature discussion and computer modeling course covering water and contaminant transport through unsaturated soils and porous material.
(To be replaced with the permanent number course when approved)
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