497 Schedule for Spring 2017

Module 1: Fuel basics Module 4: Materials issues in the fuel

Module 2: Heat transport Module 5: Materials issues in the cladding

Module 3: Mechanics Module 6: Accidents, UFD, and fuel cycle

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| 1 | 1/9  1/11  1/13 | Course summary CASL Quiz 1,  Purpose of the fuel, what atoms fission, types of fuel  Fission, heat generation, fission products |
| 2 | 1/16  1/18  1/20 | MLK day  Role of cladding, fuel geometry EMA Conf  Fuel fabrication ACS, HW 1 assigned Quiz 2 |
| 3 | 1/23  1/25  1/27 | Heat transport summary, equations, define problem ICACC  Analytical Solution, ICACC  Numerical solution, HW 1 Due |
| 4 | 1/30  2/1  2/3 | 1D solution of the heat equation in matlab  2D solution of the heat equation in matlab  Connection between coolant temp, power generation, melting HW 2, Q3 |
| 5 | 2/6  2/8  2/10 | Intro to mechanics, stress, strain, etc  Thermomechanics, thermal expansion  Mechanics equations, analytical solutions, HW 2 due |
| 6 | 2/13  2/15  2/17 | Solving equation in 1D  Solving in multiple dimensions using FEM  Fuel performance code summary and HW 3 assigned Quiz 4 |
| 7 | 2/20  2/22  2/24 | Fast intro to materials science  Fuel chemistry  Grain growth HW 3 Due |
| 8 | 2/27  3/1  3/3 | Project discussion TMS  TMS Exam review  TMS Exam |
|  | 3/6  3/8  3/10 | SPRING BREAK |
| 9 | 3/13  3/15  3/17 | Exam review, Fission products  Fission gas release  Densification, swelling, and creep |
| 10 | 3/20  3/22  3/24 | Fracture and fracture strength, HBS  Fuel thermal conductivity HW 4 assigned, I WILL BE GONE  Zirconium alloys and fabrication |
| 11 | 3/27  3/29  3/31 | Cladding growth and creep  Mechanical behavior HW 4 due  Oxidation |
| 12 | 4/3  4/5  4/7 | Hydride formation  Project work day  CRUD formation HW 5 assigned, Quiz 5 |
| 13 | 4/10  4/12  4/14 | Accident behavior – RIA  Accident behavior – LOCA, HW 5 Due, HW 6 assigned  UFD, Recycling fuel, fast reactors, why we don’t do it |
| 14 | 4/17  4/19  4/21 | Accident tolerant fuel HW 6 Due  Exam Review, Quiz 6  Exam |
| 15 | 4/24  4/26  4/28 | No class  No class, projects due  Class project summary |