

شماره درس: ۰۱_۲۴۱۸۶۵۴_تئوری		فرم طرح درس دکتری Course Plan	دانشگاه سیستان و بلوچستان	
تمام درس: مباحث ویژه ۱			دانشکده: مهندسی شهید نیکبخت	
تمام استاد: صمیمی عبدالرضا			گروه آموزشی: مهندسی شیمی	
تحوه ارزیابی		The main objective of the module is to introduce all aspects of researches that have been carried out so far in the Prof. Samimi's research team, preparing the PhD student to decide for his/her research subject. Most of researches are related to particles technology and fields from nano to macro scales. A number of subjects will be specifically reviewed including interface phenomena, membrane technologies and membrane fabrication methods, adsorption phenomena and synthesizes of nano- and bio-sorbents, nanocatalysts' synthesize, etc. Study the characteristics and performance of these materials, as well as their applications, specifically, in water and wastewater treatments, are of our prime attentions. During the term, the student must review the related papers and articles, and present a number of seminars. This course would be a good chance for the PhD student to practice in performing a systematic research with learning how to do literature review, how to write a research article, and how to present a research outcome in conferences as poster and oral presentations. At the end of the term, the student would be ready to work on preparation of his/her PhD research proposal	هدف از ارائه درس	
۴/۰۰	میان ترم			
۶/۰۰	پایان ترم			
۰/۰۰	آزمون (QUIZ)			
۳/۰۰	تمرین			
۷/۰۰	پروژه			
Introduction to particle technology Martin Rhodes, John Wiley & Son Ltd. © 2008		۱	منابع و مراجع درس	
Membrane technology and application, Richard W. Baker, 2nd Ed/2006, John Wiley and Sons		۲		
Physics and Chemistry of Interface Hans-Jurgen Butt, Karlheinz Graf, Michael Kappl, Wiley-VCH, © 2006		۳		
فناوریهای ذرات جامد (جلد اول) خواص ذرات جامد عبدالرضا صمیمی ، انتشارات دانشگاه سیستان و بلوچستان ۱۳۹۵		۴		
Handover papers and files		۵		
سرفصل مطالب و زمانبندی ارائه درس_تیمسال دوم سال تحصیلی ۱۳۹۵-۱۳۹۶				
عنوان جلسات			جلسه	
Introducing the module and scheduling the course presenting by the lecturer and the student			۱	
Membrane phenomena and processes			۲	
Membrane technology and membrane fabrication methods			۳	
Latest Technologies of Desalination (FO, MD, solar desalination, MCDI, ...)			۴	
Energy recovery devices-reverse osmosis (ERD-RO)			۵	
Water and wastewater managements			۶	
Water and wastewater managements (application of microalgae processing)			۷	
Seminar by PhD student, presenting latest papers in membrane technologies			۸	
Mid-term exam			۹	
Liquid Surfaces (surface tension)			۱۰	
Thermodynamic of Interfaces			۱۱	
Surface Forces			۱۲	
Electric Double Layer			۱۳	
Contact Angle and Wetting			۱۴	
Adsorption			۱۵	
Adsorbents synthesises (Metal Organic Framework)			۱۶	

Application of nanosorbents in environmental issues	۱۷
Seminar by PhD student, presenting latest papers in adsorption processes	۱۸
Introduction to particle technology (particle size distribution, porosity, poresize distribution)	۱۹
Mechanical properties of particulate solids	۲۰
Size enlargement processes (fluidized bed granulation)	۲۱
Size enlargement processes (high shear mixing granulation)	۲۲
Seminar by PhD student, presenting latest papers regarding syntheses of nanoparticle assemblies and their application	۲۳
Electrophoretic and electroosmosis	۲۴
Nanoparticles characteristics	۲۵
Nanoparticle syntheses (bottom-up and top-down methods)	۲۶
Nanocatalysts characteristics	۲۷
application of nanocatalysts in different processes (i.e. photocatalytics)	۲۸
Seminar by PhD student, presenting latest paper regarding catalytic processes especially in environmental issues	۲۹
Summarizing all subjects presented by the lecturer and PhD student	۳۰
Determining the probable cutting edge research areas for study by the PhD student	۳۱
Seminar by PhD student, presenting a review of the desired research subject field	۳۲