Chem 286: NMR methodology	Chem	286:	NMR	methodo	logy
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course syllabus

<u>Lab component</u>

instructor: Monika Ivancic

January 18	course overview; lab structure & schedule labs NMR spectrometer: magnet, console, computer, probe		
Jan 23 & <u>25</u>	NMR active nuclei, principles behind NMR (how and why it wor Principles behind NMR: E-levels, Boltzmann distribution	ks)	lab 1: ¹ H 1D on Bruker & using MNova
Jan 30 & Feb 1	The vector model of NMR: rotating frame, the pulse & QPD		
February 6 & 8	The vector model (cont'd): phase cycling, Nyquist & sampling the Recording the spectrum: time and frequency domains	ne FID	
Feb 13 & <u>15</u>	Practical aspects of ¹³ C NMR NOE enhancement vs. Polarization Transfer (DEPT, INEPT)	lab 2:	¹³ C 1D & DEPT on Bruker
February 22	Chemical shifts and coupling Electron shielding; origin of spin-spin coupling		
Feb 27 & Mar <u>1</u>	L X-nuclei NMR and kinetics by NMR	lab 3:	19 F & 31 P 1D on Bruker
March 6 & 8	Midterm exam T1 & T2 relaxation; Mechanisms of relaxation		
March 20 & <u>22</u>	Review of calibrating the 90° pulse Intro to 2D NMR; Homo vs. heteronuclear experiments	lab 4:	quantitative ¹ H 1D on Varian
March 27 & 29	COSY vs. TOCSY spectroscopy 1H-1H thru bond experiments		
April 3 & <u>5</u>	1H-1H thru space experiments 2D NOESY vs. ROESY theory and practice	lab 5:	COSY/TOCSY on Varian
April 10 & 12	special topics ideas: RDCs, protein NMR, large molecule NMR, Description of the presentations	OSY	
April 17 & <u>19</u>	¹ H- ¹³ C HSQC (1-bond) and HMBC (2,3-bond) spectroscopy Experiment setup; data interpretation	lab 6:	HSQC/HMBC on Varian
April 24 & 26	Dynamic NMR: lineshape analysis vs. Coalescence T; rate consta Intermolecular exchange processes	ants k _c	
May 1 & 3	Final: student presentations on special NMR topics		