



# UNIVERSITAS NEGERI YOGYAKARTA

## FAKULTAS MIPA

FRM/FMIPA/065-00

14 Februari 2011

### SYLLABUS

Fakultas : Matematika dan Ilmu Pengetahuan Alam  
Program : Pendidikan IPA  
Mata Kuliah/Kode : Kimia Dasar 2/SSC 207  
SKS : Teori = 2 sks Praktikum = 1  
Semester : II  
Dosen : Purwanti Widhy H, M.Pd

#### I. Deskripsi Mata Kuliah

Mata kuliah ini untuk mengembangkan kompetensi dalam memahami tentang Kinetika reaksi, elektrokimia dan redoks, Kimia Inti, senyawa Kimia Koordinasi, Ksp, Kimia Organik

#### II. Standar Kompetensi Mata kuliah

1. Memahami konsep kinetika reaksi
  - a. Menguasai konsep laju reaksi
  - b. Menentukan hukum laju reaksi
  - c. Menentukan hubungan antara konsentrasi reaktan dan waktu reaksi
  - d. Memahami teori tumbukan
  - e. Mengerti hubungan mekanisme dan hukum laju reaksi
  - f. Mengerti peranan katalis dalam reaksi kimia
2. Memahami konsep reaksi redoks dan elektrokimia
3. Memahami dan menerapkan konsep kimia inti dalam kehidupan sehari-hari.
4. Memahami tentang senyawa koordinasi
5. Memahami tentang Ksp
6. Memahami tentang kimia organik

#### III. Referensi

Required:

- A. Brown, Theodore L., Lemay, H. Eugene, Bursten, Bruce E., 2005, **Chemistry the central Science**, International Edition, Pearson Prentice Hall.
- B. Chang, R., 2004, KIMIA DASAR (konsep-konsep inti), edisi ketiga, jilid 2, Erlangga, Jakarta
- C. Keenan, 1989, Kimia untuk Universitas, edisi keenam, jilid 2, Erlangga, Jakarta
- D. Fessenden, 2012, Kimia Organik, edisi ketiga, jilid 2, Erlangga, Jakarta
- E. Brown, Theodore, et al., 1976, Chemistry the central science. Pearson: Pearson Prentice Hall

#### IV. Kegiatan

Week	Topics	Lecturer Strategy	Reference
1	<ul style="list-style-type: none"> <li>• Kinetika Kimia 1 <ul style="list-style-type: none"> <li>▪ Kinetics ?</li> <li>▪ Reaction rate</li> <li>▪ Important equations</li> <li>▪ Reaction rate and stoichiometry</li> <li>▪ Factors that affect reactions rate</li> </ul> </li> </ul>		A.
2	<ul style="list-style-type: none"> <li>• Chemical Kinetics-1 <ul style="list-style-type: none"> <li>▪ Rate laws</li> <li>▪ First and second order processes</li> <li>▪ The Half-life</li> <li>▪ Arrhenius equation</li> </ul> </li> </ul>		B.
3	Chemistry of Coordination Compounds <ul style="list-style-type: none"> <li>• Transition metals</li> <li>• Coordination compound <ul style="list-style-type: none"> <li>▪ Ligands</li> <li>▪ Name of coordination compounds</li> </ul> </li> <li>• Transition metal trace elements in humans</li> </ul>	Problem-solving exam, cumulative final	A. 24.1-24.6
4	Electrochemistry <ul style="list-style-type: none"> <li>• Electrochemical reaction</li> <li>• Balancing reduction dan oxidation equation</li> <li>• Voltaic cells</li> <li>• EMF (electromotive force)</li> </ul>	Problem-solving exam, cumulative final	A. 20.1-20.6
5	<ul style="list-style-type: none"> <li>• Application of redox reaction <ul style="list-style-type: none"> <li>▪ Batteries and fuel cells</li> <li>▪ Corrosion</li> <li>▪ Electrolysis</li> </ul> </li> </ul>	Problem-solving exam, lab participation, cumulative final	A.20.7-20.9
6	Nuclear Chemistry <ul style="list-style-type: none"> <li>• The Nucleus <ul style="list-style-type: none"> <li>▪ Isotop</li> <li>▪ radioactivity</li> </ul> </li> <li>• Type of radioactive decay</li> <li>• Kinetics of radioactive decay</li> <li>• Energy in nuclear radioactive decay</li> </ul>	Problem-solving exam, cumulative final	A. 21.1-21.6
7	<ul style="list-style-type: none"> <li>• Nuclear fission</li> <li>• Nuclear reactor</li> <li>• Nuclear fusion</li> <li>• Biological effects of radiation</li> </ul>	Discusses & presentation	A. 21.7-21.9
8	MIDDLE TEST		B.
9	Ksp		C.
10	Organic and Biological chemistry <ul style="list-style-type: none"> <li>• Organic chemistry-1 <ul style="list-style-type: none"> <li>▪ Alkanes (properties, Isomers, Organics nomenclature, Cycloalkanes, Reaction)</li> <li>▪ Alkenes (properties,</li> </ul> </li> </ul>	Problem-solving exam, cumulative final	A.25.1-25.3

	nomenclature, Cycloalkanes, mekanisme of additions Reaction) <ul style="list-style-type: none"> <li>▪ Alkynes (nomenclaturem aromatic HC, functional group)</li> </ul>		
11	<ul style="list-style-type: none"> <li>• Organic chemistry-2 <ul style="list-style-type: none"> <li>▪ Alkohols</li> <li>▪ Eters</li> <li>▪ Carbonyl compound</li> <li>▪ Aldehydes</li> <li>▪ Ketones</li> <li>▪</li> </ul> </li> </ul>		
12	<ul style="list-style-type: none"> <li>• Carboxylic acids</li> <li>• Esters</li> <li>• Amides</li> <li>• Amines</li> <li>• Chyrality</li> </ul>		
13	<ul style="list-style-type: none"> <li>• Amino Acids and protein <ul style="list-style-type: none"> <li>▪ Amino acid (types and structure)</li> <li>▪ Properties of amino acids</li> <li>▪ Usefullnes of protein</li> <li>▪ Polymer of amino acids</li> </ul> </li> </ul>	Problem-solving exam, cumulative final	A.25.4
14	<ul style="list-style-type: none"> <li>• Carbohydrates <ul style="list-style-type: none"> <li>▪ Mono-, di-, polyssakarida</li> <li>▪ Identify of caarbohydrate</li> </ul> </li> </ul>	Problem-solving exam, cumulative final	A. 25.5-25.6
15	<ul style="list-style-type: none"> <li>• Lipid <ul style="list-style-type: none"> <li>▪ Lipid acid</li> <li>▪ Strucutre of lipid</li> <li>▪</li> </ul> </li> <li>• Saponification</li> </ul>	Discuses & presentation	A. 25.9
16	<b>Final exam</b>	Cumulative final	Individual participans

#### V. Assessment

No	Component	Weight (%)
1	In-Class Participation	5%
2	Assignments	15%
3	Mid-Term Exam	30%
4	Final Exam	50%
	Total	100%

Yogyakarta, february 12<sup>th</sup> 2012

Lecturer

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