TIMETABLE CH1010 SEMESTER 2 2006

Day1

4/12	Slot	L	Lect1.ppt	Intro: Biological chem, atomic structure, PTable, matter
	Slot	T	Tutorial 1	Bonding, redox, acid/base, pH, concs- hand out Lect 1
	Slot	L	Lect2.ppt	Bonding (covalent, ionic, H), reactions, equilibria, pH
	Slot	P	Prac 1	Safety
	Slot	L	Lect3.ppt	Mole, solutions, buffers, amino acids, heat & rate rxns.

Day **Module**

1 1 *Basic chemistry*: atomic structure, periodic table, phases of matter, bonding types (covalent, ionic, hydrogen, inter-, intra-), acid/base, oxidation/reduction reactions, equilibrium, pH.

Day2

5/12	Slot	L	Lect4.ppt	*Organic*: functional grps, IUPAC names, addition rxns,
	Slot	T	Tutorial 2	Functional grps, Organic IUPAC naming, addition.
	Slot	L	Lect5.ppt	*Natural products*: separation, purification, characterisation
	Slot	P	Prac 2	Amino acid prac.
	Slot	L	Lect6.ppt	Spectroscopy (IR, Beer Law, NIR).

Day **Module**

2 2 *Organic chemistry*: chemical structures, identifying functional groups, IUPAC naming method for simple organic compounds. *Natural product chemistry*: extraction, separation, purification and characterisation of an organic chemical. Spectroscopy – use in characterisation and analysis (Beer Law).

Day3

6/12	Slot	L	Lect7.ppt	UV-Vis, terpenes, alkaloids, steroids, lignins.
	Slot	T	Tutorial 3	Organic naming. Characterisation of organics.
	Slot	L	Lect8.ppt	*Carbohydrates* - monosaccharides, lactose, cellulose,
	Slot	P	Prac 3	Functional groups Chem3D
	Slot	L	Lect9.ppt	*Proteins* – amino acids, structure (1^o, 2^o)

Day **Module**

3 3 Natural products: terpenes, alkaloids, steroids, lignins.
Biopolymers: Carbohydrates –Fischer & Haworth projections monosaccharides. Lactose. Cellulose. Acidic polysaccharides. Proteins – amino acids, isoelectric point, 1^0, 2^0 (α-helix, β-sheet) structure.

Day4

7/12	Slot	L	Lect10.ppt	Protein structure (3^o, 4^o), glycoprotein, nucleic acids, ATP
	Slot	T	Tutorial 4	Carbohydrates – projections, amino acids, nucleic acids.
	Slot	L	Lect11.ppt	DNA & RNA structure, chromatography (SE, GE).
	Slot	P	Prac 4	TLC chromatography + Paper chromatography.
	Slot	L	Lect12.ppt	*BioInorganic* – carbon oxides, TM coordination cmpds

Day **Module**

4 4 Proteins – 3^0, 4^0 structure, denaturing, glycoproteins.
Biopolymers II: Nucleic acids – DNA structure (1^o, 2^o, 3^o), RNA types, chromosome structure, genes, macromolecular chromatography (size exclusion, gel electrophoresis). *Bioinorganic*– main group (CO, CO_2), transition metal coordination compounds, ligands (monodentate, bidentate, macrocyclic).

Day5

8/12	Slot	L	Lect13.ppt	Hemoglobin, chlorophyll, cofactors, Fe-S clusters
	Slot	T	Tutorial 5	DNA, RNA, coordination compounds, enzymes, vitamins.
	Slot	L	Lect14.ppt	*Enzymes*, inhibition, proenzymes, allosterism, assays.
	Slot	P	Prac 5	Cholesterol extraction
	Slot	L	Lect15.ppt	Nutrients, Vitamins (A, B, C, D_3, E), Coenzymes.

Day	**Module**	
5	5	*Bioinorganic*: Heme, Hemoglobin, chlorophylls, cofactors. *Enzymes*: lock-and-key, inhibitors, proenzymes, isoenzymes, allosterism, enzyme assays. Nutrient classifications. Vitamin structure and function (A, B, C, D_3, E).

Weekend 1

9/12, 10/12		Revision
Day	**Module**	
Wknd	6	*Bioinorganic*: Heme, Hemoglobin, chlorophylls, cofactors. *Enzymes*: lock-and-key, inhibitors, proenzymes, isoenzymes, allosterism, enzyme assays. Nutrient classifications. Vitamin structure and function (A, B, C, D_3, E).

Day6

11/12	Slot	L	Lect16.ppt	*Lipids* – triglycerides, glycerophospholipids
	Slot	T	**Test 1**	
	Slot	L	Lect17.ppt	Sphingolipids, glycolipids, membranes (fluid mosaic)
	Slot	P	Prac 6	Recrystallisation
	Slot	L	Lect18.ppt	Passive, active transport, steroids, cholesterol transport

Day	**Module**	
6	7	*Lipids*: triglycerides, phosphoglycerides, sphingolipids, glycolipids, steroids, prostoglandins, bile salts. Membrane structure (fluid mosaic model), transport (passive, active), lipoprotein cholesterol transport.

Day7

12/12	Slot	L	Lect19.ppt	*Catabolism*: structure/func^{n} - ATP, NAD^+, FAD, CoA
	Slot	T	Tutorial 6	Lipids. Steroids. Transport.
	Slot	L	Lect20.ppt	Citric acid cycle.
	Slot	P	Prac 7	Micropipettes & spectrometers.
	Slot	L	Lect21.ppt	Glycolysis, pyruvate fate, FA & protein catabolism.

Day	**Module**	
7	8	*Catabolism*: ATP, NAD^+, FAD, CoA structure and function. Citric acid (TCA) cycle (8 steps). Glycolysis pathway. Fate of pyruvate. Fatty acid and protein catabolism.

Day8

13/12	Slot	L	Lect22.ppt	Oxidative phosphorylation, chemiosmotic theory.
	Slot	T	Tutorial 7	coenzyme structures. TCA cycle. Glycolysis. Pyruvate.
	Slot	L	Lect23.ppt	FA synthesis. Photosynthesis basics.
	Slot	P	Prac 8	Proteins, Enzymes + Casein.
	Slot	L	Lect24.ppt	Photosynthesis: Z-scheme, Calvin cycle, ribulose

Day	**Module**	
8	9	*Catabolism II*: oxidative phosphorylation, electron transport chain, proton pump, chemiosmotic theory. *Anabolism*: Fatty acid synthesis (5 steps), Photosynthesis – Z-scheme, Calvin cycle, ribulose, photophosphorylation.

Day9

14/12	Slot	L	Lect25.ppt	DNA replication, cloning.
	Slot	T	Tutorial 8	Oxphos. Proton pumps. FA synthesis. Photosynthesis.
	Slot	L	Lect26.ppt	PCR, mutations, recombinant DNA, gene structure
	Slot	P	Prac 9	Gel electrophoresis
	Slot	L	Lect27.ppt	Protein synthesis – DNA transcription, regulation

Day	**Module**	
9	10	*DNA*: DNA replication (6 steps), replisomes, Osazaki fragments, cloning, PCR, mutations, recombinant DNA, gene structure. DNA transcription – RNA Polymerases, transcription factors, regulation, post-transcription modification.

Day10

15/12	Slot	L	Lect28.ppt	Protein synthesis –genetic code, translation, tRNA
	Slot	T	Tutorial 9	DNA replication, PCR, mutations. Genetic code.
	Slot	L	Lect29.ppt	Translation, post-translation, regulation.
	Slot	P	Tutorial 10	Protein synthesis. Transcription. Translation.
	Slot	P	Exam Tutorial	
	Slot	L	Workshop	If necessary

Day	**Module**	
10	11	*DNA II*: Protein synthesis DNA translation – genetic code, tRNA, ribosome structure, amino acid activation, polysomes, regulation, post-translation modification.

Weekend 2

16/12 Revision
17/12 Exam

29 Lectures x 1 hour
10 tutorials x 1 hour (+ 1 test)
8 practicals x 3 hour (+ 1 Safety)