English 1113

Title: Functional English

i. Grammar :

1. Morpheme (classification, parts of speech, synonym, antonym change)
2. Verb (Finite, nonfinite, transitive, intransitive, lexical/principal, auxiliary, stative, dynamic, linking, infinitive, gerund, participle)
3. Distinction between phrase and clause
4. Clause(compulsory and optional elements of a clause, classifications of clauses, identification) [materials: ABC of English Grammar by Jahurul Islam; Chapter 8:The Clause, Chapter 12: The Complex Sentence]
5. Sentence (functional &structural classification, identification)
6. Conditional sentence

ii. Reading :

1. Reading techniques (scanning, skimming, intensive,extensive)
2. SQ3R technique
3. Reading comprehension from passage
4. Precis/ summary
5. Paraphrase

iii. Phonetics :

1. Concepts (phonetics, phonology, phones, phoneme, allophones)
2. Vowels (monophthong, diphthong, triphthong)
3. Consonants
4. Word transcription

CSE 1101

Title: Structured Programming

i. Basic Concept:

1. Basic idea of algorithm
2. How compiling work?
3. Program debugging
4. Definition and difference of Compiler and Interpreter

ii. Baby step:

1. Basic I/0 and formatted I/O) [I: Input, O: Output]
2. Different data types and their size
3. Operators along with their order and behaviors
4. Operation, Expression and Expression evaluation
5. Conditional Logic [If-else, switch-case, ternary]
6. ASCII value of character (use your brain)
7. Character usage and tricks by using it as integer

iii. Loop:

1. For loop
2. While loop
3. do-while loop
4. Usage of continue and break operation
5. Nested loop

iv. Array:

1. Different type and style of declaration and initialization
2. Multi-dimensional array
3. Array manipulation [indices, enumerate, divide, concatenation, search, sort]
4. Array of pointer

v. String:

1. String operation [concatenation, compare etc.]
2. Difference between string and character array
3. Importance of string and null (\0) character
4. String I/O
5. Array of string

vi. Pointer
(The gate of madness along with reality check)

1. Introduction and understanding of pointer
2. Pointer operation

3. Pointers of array
4. Array of pointer

vii. Function:

1. Defining and calling method of user-defined function
2. Void functions with no parameter
3. Return type and parameter of function
4. Call by values
5. Function with pointer as parameter
6. Scope of variable [Local and Global]
7. Built-in function
8. Recursive function
9. Array as parameter
10. Call by reference

viii. Custom Data Types:

1. Structures
2. Unions
3. Enumerations

ix. File:

1. Basic file operation [Opening, Closing]
2. Updating binary and sequential files
3. Files I/O

x. Advanced Topics:
(I have no idea from where those guys came)

1. Operation on bits
2. Preprocessors and macros

Math 1113

Title: Differential and Integral Calculus

i. Differential Calculus:
(Everything other than Helal Sir's sheet is a lie)

1. Limit
2. Continuity and Differentiability
3. Differentiation of Explicit and Implicit Function and Parametric Equations
4. Significance of Derivatives
5. Differentials, Successive
6. Differentiation of Various Types of Functions
7. Leibnitz's Theorem
8. Rolle's Theorem
9. Mean Value Theorem
10. Taylor's Theorem in Finite and Infinite Forms
11. Maclaurin's Theorem in Finite and Infinite Forms
12. Lagrange's Form of Remainders
13. Cauehy's Form of Remainder
14. Expansion of Functions by Differentiation and Integration
15. Partial Differentiation
16. Euler's Theorem
17. Tangent and Normal
18. Maxima and Minima
19. Points of Inflection and their Applications
20. Evaluation of Indeterminate Forms by L'Hospital Rule
21. Curvature
22. Evaluate and Inviolate
23. Asymptotes
24. Envelopes
25. Curve Tracing

ii. Integral Calculus:

1. Definitions of Integration
2. Integration by the Method of Substitutions
3. Integration by the Method of Successive Reduction
4. Definite Integrals
5. Beta Function and Gamma Function
6. Area under a Plane Curve in Cartesian and Polar Coordinates
7. Area of the Region Enclosed by Two Curves in Cartesian and Polar Coordinates
8. Parametric and Pedal Equations
9. Intrinsic Equation
10. Volumes of Solids of Revolution
11. Volume of Hollow Solids of Revolution by Shell Method
12. Area of Surface of Revolution
13. Multiple Integration

EEE 1151

Title: Basic Electrical Engineering

i. AC Current:

1. Signal and Waveforms
2. Instantaneous and RMS Values of Current
3. Voltage and Power
4. Average Power
5. AC Analysis for Various Combination of R
6. L and C Circuits
7. Phasor Representation of Sinusoidal Quantities
8. Resonance
9. Frequency Response
10. Passive Filters

ii. DC Circuit:

1. Voltage
2. Current
3. Resistance and Power
4. Laws of Electrical Circuits
5. Methods of Network Analysis
6. Capacitance
7. Types of Capacitors
8. Capacitors in Series and Parallel
9. Inductance
10. types of Inductors
11. Faraday’s Law and Lenz’s Law
12. Inductors in Series and Parallel.

Chem 1113

Title: Inorganic and Physical Chemistry

i. Chemical Bond:

1. Ionic Bond
2. Covalent Bond
3. Coordination Bond
4. Metallic Bond
5. Hydrogen Bond
6. Dipole Bond
7. Vander Waal's Forces
8. Hybridization
9. Resonance
10. Valence Bond Theory (VBT)
11. Molecular Orbital Theory (MOT)
12. Linear Combination of Atomic Orbital (LCAO) Method

ii. Thermo-chemistry:

1. Types of Energy
2. Enthalpy of Reaction
3. Heat of Combustion
4. Heat of Formation
5. Heat of Neutralization
6. Experimental Determination of Thermal Changes during Chemical Reaction

iii. Solution:

1. Types of Solution
2. Factors Influencing the Solubility of Substance
3. Mechanism of Dissolution
4. Solution of Gases in Liquids
5. Different Units of Concentration
6. Distribution Law and its Application
7. Properties of Dilute Solution
8. Raoult's Law and its Application
9. Elevation of Boiling Point
10. Depression of Freezing Point and Osmotic Pressure

iv. Conductivity:

1. Type of Conductors
2. Conductance
3. Specific Conductance
4. Equivalent Conductance
5. Mechanism of Electrolytic Conductance

6. Factors Influencing Conductivity
7. Arrhenius Theory
8. Law of Independent Migration of Ions and its Applications
9. Determination of Transport Number
10. Abnormal Conductance

v. Electro-chemistry:

1. Electrochemical Cell
2. Cell Reaction
3. Cell Potential
4. Cell Representation
5. Measurement of EMF of a Cell
6. Relation Between EMF and Free Energy
7. Electrode Potential
8. Electrochemical Series
9. Nernest's Equation
10. Different Types of Reference Electrodes and pH Measurement
11. Over Potential
12. Lithium Ion Battery
13. Fuel Cell its Latest Development

vi. Photo-chemistry:

1. Photo-chemical Reactions
2. Laws of Photo-chemistry
3. Quantum Yield and its Determination
4. Photo-sensitized Reaction
5. Photo-Physical Processes

vii. Spectroscopy:

1. Quantization of Energy
2. Basic Elements of Spectroscopy

viii. Polymerization:

1. Classification
2. Bonding in Polymer
3. Thermosetting and Thermoplastic Polymer
4. Synthesis
5. Properties and Uses of Some Polymers-Polyethylene
6. PVC, Bakelite, Melamine etc.