**Detailed Syllabus**

**Lecture-wise Breakup**

| **Subject Code** | 16B1NCI635 | **Semester Even** | **Semester** Even **Session 2019**  **Month from January to June** |
| --- | --- | --- | --- |
| **Subject Name** | Data and Web Mining | | |
| **Credits** | 4 | **Contact Hours** | 4 |

| **Faculty (Names)** | **Coordinator(s)** | Neetu Sardana |
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| **Teacher(s) (Alphabetically)** |  |

| S. No. | **Course Objective** | **Cognitive Level**  **(Bloom’s Taxonomy)** |
| --- | --- | --- |
| CO1 | Apply the pre-processing techniques to nominal, binary, categorical and ordinal data. | Apply Level  (Level III) |
| CO2 | Design a Data warehouse using star, snowflake and galaxy schema and perform OLAP operations like roll-up, drill-down, slicing and dicing, etc | Apply Level  (Level III) |
| CO3 | Apply a wide range of classification techniques like Naïve-bayes, decision tree, and KNN for the numerous application including fraud detection, target marketing, medical diagnosis, etc. | Apply Level  (Level III) |
| CO4 | Cluster the similar/dissimilar objects using different methods like partitioning, hierarchical and density based clustering. | Create Level  (Level VI) |
| CO5 | Analyze the transactional data for finding frequent and interesting patterns using association rule mining techniques like Apriori and FP-Growth. | Analyse Level  (Level IV) |
| CO6 | Analyze the link structure of web using page rank and HITS algorithms. | Analyse Level  (Level IV) |

| **Module No.** | **Subtitle of the Module** | **Topics in the module** | **Co’s** | **No. of Lectures for the module** |
| --- | --- | --- | --- | --- |
| **1.** | Chemical Reactions | Chemical equation, Balanced chemical equation, implications of a balanced chemical equation, types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction. | CO1 | 3 |
| **2.** | Acids, bases and salts | Their definitions in terms of furnishing of H+ and OH– ions, General properties, examples and uses, concept of pH scale (Definition relating to logarithm not required), importance of pH in everyday life; preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and Plaster of Paris. | CO2 | 1 |
| **3.** | **Metals and nonmetals** | Properties of metals and non-metals; Reactivity series; Formation and properties of ionic compounds; Basic metallurgical processes; Corrosion and its prevention. | CO2 | 1 |
| **4.** | **Carbon compounds** | Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series. Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydrocarbons and unsaturated hydrocarbons. Chemical properties of carbon compounds(combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps and detergents. | CO2 | 2 |
| **5.** | **Periodic classification of elements** | Need for classification, early attempts at classification of elements (Dobereiner’s Triads, Newland’s Law of Octaves, Mendeleev’s Periodic Table), Modern periodic table, gradation in properties, valency, atomic number, metallic and non-metallic properties. | CO3 | 9 |
| **6.** | Life processes | ‘Living Being’. Basic concept of nutrition, respiration, transport and excretion in plants and animals. | CO4 | 6 |
| **7.** | **Control and co-ordination in animals and plants** | Tropic movements in plants; Introduction of plant hormones; Control and co-ordination in animals: Nervous system; Voluntary, involuntary and reflex action; Chemical co-ordination: animal hormones. | CO5 | 6 |
| **8** | **Reproduction** | Reproduction in animals and plants (asexual and sexual) reproductive health-need and methods of family planning. Safe sex vs HIV/AIDS. Child bearing and women’s health. | CO6 | 4 |
| **9** | **Heredity and Evolution** | Heredity; Mendel’s contribution- Laws for inheritance of traits: Sex determination: brief introduction; Basic concepts of evolution. | CO6 | 3 |
| **10** | **Natural Phenomena** | Reflection of light by curved surfaces; Images formed by spherical mirrors, center of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification, Refraction; Laws of refraction, refractive index.Refraction of light by spherical lens; Image formed by spherical lenses; Lens formula (Derivation not required); Magnification. Power of a lens, Functioning of a lens in the human eye, defects of vision and their corrections, applications of spherical mirrors and lenses, Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life. | CO6 | 3 |
| **11** | **Effects of Current** | Electric current, potential difference and electric current. Ohm’s law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R. | CO6 | 3 |
| **12** | **Magnetic effects of current** | Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming’s Left Hand Rule, Electric Motor, Electromagnetic induction. Induced potential difference, Induced current. Fleming’s Right Hand Rule, Electric Generator, Direct current. Alternating current: frequency of AC. Advantage of AC over DC. Domestic electric circuits. | CO7 | 4 |
| **13** | **sources of energy** | Different forms of energy, conventional and non-conventional sources of energy: Fossil fuels, solar energy; biogas; wind, water and tidal energy; Nuclear energy. Renewable versus non-renewable sources of Energy. | CO8 | 10 |
| **14** | **Our environment** | Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable substances. | CO9 | 11 |
| **15** | **Management of natural resources** | Conservation and judicious use of natural resources. Forest and wild life; Coal and Petroleum conservation. Examples of people’s participation for conservation of natural resources. Big dams: advantages and limitations; alternatives, if any. Water harvesting. Sustainability of natural resources. | CO10 | 5 |

| **Recommended Reading material:** Author(s), Title, Edition, Publisher, Year of Publication etc. ( Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format) | |
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|  | Jiawei Han, Micheline Kamber, Data Mining, Morgan Kaufmann Publishers,Elsevier,2005 |
|  | Kimball R. and Ross M ,The Data Warehouse Toolkit”, Wiley |
|  | Pujari, Arun K,Data mining and statistical analysis using SQL, Universities press |
|  | Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining |
|  | Soumen Chakrabarti, Mining the Web:Discovering knowledge from hypertext data”, Morgan Kaufmann, Elsevier |
|  | Alex, Berson,StephenJ.Smith, Data Warehousing, data mining and OLAP , McGraw-Hill,2004 |
|  | InmonW.H.,Building the Data Warehouse ,4th Edition, Wiley |
|  | Anahory S. and Murray D, Data Warehousing in the Real World, Addison-Wesley |
|  | Margaret H. Dunham, Data Mining: Introductory and Advanced Topics, Prentice Hall,2003 |
|  | Mattison R. ,Web Warehousing and Knowledge Management”, Tata McGraw-Hill. |
|  | David Hand, HeikkiMannila and Padhraic Smyth ,Principles of Data Mining,PHI |
|  | Transactions on Database Systems (ACM) |
|  | IEEE Transactions on Knowledge & Data Engineering |
|  | The VLDB Journal The International Journal on Very Large Data Bases |