Schedule for Semester III,

Course title: Bioinorganic Chemistry (June 2018 onwards)

Course code: CHE-III. E-4

Schedule for Semester III:

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| **Lecture Sr. No.** | **Unit** | **Subunit** | **References** | **Remarks (if appl.)** |
| 01. | **Unit 1**: Introduction to Bioinorganic Chemistry | Introduction , Essential and trace elements in biological processes |  |  |
|  |  |  |  |  |
| 02. |  | Distribution of elements in biosphere, Bioavailability and biostability |  |  |
| 03. |  | Biologically important compounds:  1. sugars (carbohydrates)  2. fatty acids (lipids)  3. Nucleotides (nucleic acids)  4. Amino acids (proteins) |  |  |
| 04. |  | Biological importance of water |  |  |
| 05. |  | Metallobiomolecules |  |  |
|  |  |  |  |  |
| 06. | **Unit 2:** Alkali and alkaline earth metals in biological systems | Structures and biological membranes |  |  |
| 07. |  | Mechanism of ion transport across membranes, Sodium pump |  |  |
| 08. |  | Tutorial |  |  |
| 09. |  | Test No. 1: Written test |  |  |
|  |  |  |  |  |
| 10. |  | Ionophores, Valinomycin |  |  |
| 11. |  | Crown ether complexes of Na+ and K+ |  |  |
| 12. |  | Photosynthesis : Chlorophyll a: PS-I |  |  |
| 13. |  | Photosynthesis : Chlorophyll a: PS-II |  |  |
| 14. |  | Role of Calcium in muscle contraction and blood clotting |  |  |
| 15. | **Unit 5:** Chemistry of elements in medicines | Metals as diagnostic and therapeutic agents: chelation therapy |  |  |
| 16. |  | Tutorial |  |  |
| 17. |  | Test No. 2: MCQ |  |  |
| 18. |  | Cancer treatment, Anti-arthritis drugs |  |  |
| 19. |  | Platinum complexes as anticancer drugs, Pt-DNA binding |  |  |
| 20. |  | Complexes of Gold, Copper, Zinc, Mercury, Arsenic and Antimony as drugs |  |  |
| 21. |  | Quick recap/Revision/Tutorial |  |  |
| 22. |  | Review/ Feedback |  |  |

Text Book for the course:

1. Bioinorganic Chemistry, *Bertini I, Gray HB, Lippard SJ, and Valentine JS*, University Science Books

Reference Books:

1. The Biological Chemistry of the Elements, *DaSilva JJRF and Williams RJP,* Oxford University Press
2. Bio-coordination Chemistry, *Fenton DE,* Oxford Chemistry Printers and Oxford University Press
3. Inorganic Chemistry, *Atkins P, Overton T , Rourke J, Weller M and Armstrong ,* Oxford University Press