

DEPARTMENT OF COMPUTER SCIENCE

Syllabus for Ph.D. Entrance Exam

Unit I : Programming Languages:

C: Functions, Program Structure, Arrays, Pointer, Structure and Union, Data Files, Low-level Programming, Some Additional Features of C.

C++: Getting to grips with C++, Modeling Real world, Classes and Objects, Object Lifetimes and dynamic objects, the metaclass, Inheritance and Classification Hierarchies, Introduction to Polymorphism, Operator Overloading.

Java: Classes, Inheritance, Packages and Interfaces, Java Applet, Networking, Event Handling, AWT, Java Beans, Swing, Servlets

Unit II : Computer Networks

Introduction – Computer Network fundamentals – Types of networks – LAN – WAN – MAN – Internetworks – Reference Models – OSI – TCP/IP Models – Data Communication - Channel Capacity – Transmission media – Twisted Pair – Coaxial Cable – Fiber Optics – Wireless transmission – Radio – Microwave – Multiplexing – Switching – ISDN – ATM – Switch /Hub – Bridge – Router – Gateways – Routing algorithms – Congestion Control.

Unit III : Digital Image Processing

Digital Image Fundamentals – Steps in Image Processing-Elements of visual perception – Image sampling and quantization – Image enhancement in spatial domain and frequency domain – Image restoration – Color Image Processing – smoothing and sharpening – Image compression models – Error free compression – Lossy and Lossless compressions – Image Compression standards

Unit IV : Data Mining

Introduction to Databases – Data mining functionalities – Steps in Data Mining Process – Architecture of typical Data Mining Systems – Classification of Data Mining systems – Overview of Data Mining Techniques – Data Preprocessing – Data Cleaning, Integration, Transformation, Reduction – Classification and prediction – Issues regarding classification and prediction – Applications of Data Mining – Social impacts of Data Mining Tools.

Unit V : GK & Aptitude Portion

Reference Books:

1. Byron S Gottfried, “Programming with C”, Schaum’s Outline Series – Tata McGraw Hill Publications, New Delhi.
2. David Parson, “Object Oriented Programming with C++”, Continuum – 2002
3. Herbert Schildt, “The Complete Reference – JAVA 2”, Tata McGraw Hill Publications, New Delhi.
4. Craig Zacker, “The Complete Reference – Networking”, Tata McGraw Hill Publications, New Delhi.
5. “Digital Image Processing”, - Rafael C.Gonzalez and Richard E.Woods, Addison Wesley, Second Edition
6. “Data Mining Concepts and Techniques” – Jiawei Han and Michaline Kamber.