

**(III) Area of Specialization Courses in Computer Studies & Data Analysis**  
**TEACHING OF COMPUTER STUDIES&DATA ANALYSIS**

**Course code: EDBET356**

**Credit Hours: 3**

**Course Description**

The broad purpose of this course is to develop students' knowledge, skills, and abilities as computer science and information technology educationist. In particular, this course aims to develop at high level of understanding and a critical analytic perspective across a diverse range of computer studies and data analysis by focusing on conceptual, theoretical and substantive research findings found in the academic research literature in the field.

**Learning Outcomes**

Upon completion of this course, the students:

1. Will understand implications of computer technology for society.
2. Will utilize help, tutorial, or expert features of software in order to acquire specific software skills.
3. Will develop knowledge and skills that enable the student to evaluate, critique, and ultimately contribute to the skills and scholarly literature in computer studies.
4. Should have improved their written and verbal communication and analytical skills and feel comfortable discussing theoretical and methodological issues in a scholarly manner.
5. Will gain an appreciation of the development of knowledge in a range of topic areas.
6. Will learn about the institutions, systems, and practices found in academic as well as research process.
7. Developing a hypothesis, a research problem and related questions.
8. Framing the problem with the correct research methodology.
9. Collecting data that accurately addresses the research problem
10. Using data to make decisions.

**Contents**

**1. 1 - Computer Applications**

- 1.1. The Computer System
- 1.2. Serial and Direct Method of Access
- 1.3. Common Application Software
- 1.4. The Spread Sheet
- 1.5. The Word Processor
- 1.6. Graphic Packages
- 1.7. Communication Tools
  - 1.7.1. The Web Browser
  - 1.7.2. E-Mail
  - 1.7.3. Chat Clients
  - 1.7.4. Skype
  - 1.7.5. Creating Web Pages
- 1.8. Threats to Computer
- 1.9. Virus & Antivirus
- 1.10. Data Management and Security

**2. 2 - Computer Architecture and Data Representation**

- 2.1. Computer Architecture
  - 2.1.1. Components of a Computer System

- 2.1.2. Basic Features of an Operating System
- 2.1.3. Computer Logic
- 2.1.4. Logic Circuits
- 2.1.5. The CPU
- 2.1.6. Storage
- 2.1.7. Input Devices
- 2.1.8. Output Devices
- 2.2. Data Representation
  - 2.2.1. Number Systems
  - 2.2.2. Coding Systems
  - 2.2.3. Databases
  - 2.2.4. Data and Information
- 3. **3 - Computer Systems**
  - 3.1. Programming and application packages
  - 3.2. Roles related to an I.T. environment
  - 3.3. System Analysis
  - 3.4. Networks
  - 3.5. Types of Operating Systems
- 4. **4 - Information and Communication Technology in Education and Society**
  - 4.1. Areas of Computer Applications
  - 4.2. Effects of Computer-Based Systems on Individuals, Organizations and Society
  - 4.3. Data Security and Privacy
  - 4.4. Multimedia
  - 4.5. Computer-Based instruction
  - 4.6. Computer-Based evaluation
- 5. **5 - Mathematical and Statistical Methods for Data Analysis**
  - 5.1. Descriptive Analysis
  - 5.2. Exploratory
  - 5.3. Regression Analysis
  - 5.4. Factor Analysis
  - 5.5. Dispersion Analysis
  - 5.6. Discriminant Analysis
  - 5.7. Time Series Analysis
- 6- Introduction to The Process of Conducting Research
- 7 -Research Design
- 8- Introduction to Qualitative Research
- 9- Introduction to Quantitative Research
- 10. 10- Sampling Concepts
- 11. 11- Quantitative Data Collection Instruments
- 12. 12- Introduction to Applied Statistics
- 13. 13- Descriptive Statistics
- 14. 14- Inferential Statistics
- 15. 15 - Statistics of 1 variable & Correlation of 2 variables
- 16. 16 - Variables, reliability, validity
- 17. 17-Writing Data Analysis Reports

### 18. Teaching-learning Strategies

The instructional strategies will focus on constructionist learning approach. These strategies will be diverse in line with the course contents. Therefore, these strategies will include but not limited to demonstration, cooperative learning, collaborative learning, teacher and student-led discussion, individual and group presentations, reflective practices and classroom activities.

#### Assessment and Examinations

The students will be assessed according to the following criteria.

Examination	Marks Distribution
Sessional work	25%
Mid Semester	35%
Final Semester	40%

#### Suggested Readings

- Branch, J., Collins, M., & Sotnick-Yogev, E. (2018). *Contemporary Issues in Digital Marketing: New Paradigms, Perspectives, and Practices*. Farington: Independent Publishers Group.
- Creswell, J. W., & Clark, P. V. L. (2006). *Designing and conducting mixed methods research*. Thousand Oaks, California: Sage.
- De Vries, M. J. (2018). *Teaching about Technology: An Introduction to the Philosophy of Technology for Non-philosophers (Contemporary Issues in Technology Education)*. Netherlands: Springer.
- Field, A. (2009). *Discovering Statistics using SPSS (3rd ed)*. Thousand Oaks, CA: SAGE Publications.
- Govt. of Pakistan. (2003). *Education for All*. Islamabad: Ministry of Education Curriculum Wing.
- Haltak, J. (1990). *Investing in the Future, Setting Educational Priorities in the Developing World*. Paris, UNESCO: McGraw-Hill Kogakusha.
- Huck, S. W. (2011). *Reading statistics and research (6th ed.)*. Boston: Allyn & Bacon.
- Indira, M. (2003). *Changing Demands of Technical and Vocational Education*. New Delhi: Annual Publication.
- Norton, P. *Introduction to Computer (7<sup>th</sup> ed) (Special Indian ed)*. New Delhi: Tata McGraw-Hill Education Pvt. Ltd.
- Robert, M., Baird, R., Mays, R. & Stuart, E. R. (Eds.) (2000). *Cyberethics: Social & Moral Issues in the Computer Age*. New York: Prometheus Books.
- Shelly, G.B., Cashman, T. J. & Vermatt, M. E. (2001). *Discovering Computers 2002: Concepts for a Digital World, Brief (1st ed)*. Boston: Course Technology.
- Scham's Series. *Introduction to Computer Science*. \_\_\_\_\_.
- UNESCO, Pakistan. (2004). *Quality of education in Pakistan*. Islamabad: UNESCO.