ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

MANGALORE UNIVERSITY

(Accredited by NAAC with 'A' Grade)

ಕ್ರಮಾಂಕ/ No. : MU/ACC/CR 40/2019-20/A2

ಕುಲಸಚಿವರ ಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ – 574 199
Office of the Registrar
Mangalagangothri – 574 199
ದಿನಾಂಕ/Date:20.01.2021

NOTIFICATION

Sub: Syllabus of Career Oriented Programme in Data Analysis, Cloud Computing & Cyber Security

Ref: Academic Council approval vide agenda No.: ಎ.ಸಿ.ಸಿ.:ಶೈ.ಸಾ.ಸ.2:6 (2020–21) dtd 23.12.2020.

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The syllabus of Career Oriented programme in Data Analysis, Cloud Computing & Cyber Security which has been approved by the Academic Council at its meeting held on 23.12.2020 is hereby notified for implementation with effect from the academic year 2020-21.

Copy of the Syllabus shall be downloaded from the University Website (www.mangaloreuniversity.ac.in)

REGISTRAR

To,

1. The Principals of the College concerned
2. The Chairman, Combined UG BOS in Computer Science & Computer Applications, Dept of PG Studies and Research in Computer Science, Mangalore University.
3. The Registrar (Evaluation), Mangalore University, Mangalagangothri.
4. The Superintendent (ACC), O/o the Registrar, Mangalore University.
5. The Asst. Registrar (ACC), O/o the Registrar, Mangalore University.
6. The Director, DUIMS, Mangalore University – with a request to publish in the website.
7. Guard File.

DATA ANALYSIS, CLOUD COMPUTING AND CYBER SECURITY-DCCS

Preamble:

Data Analysis shows the result of analysis discussion of this analysis. Reliability analysis, descriptive analysis to analyze the primary data. Cloud computing introduces the knowledge about cloud database and the security. Cyber security expands about the safety under online transaction and the action against cyber crime.

Objectives:

- This course will introduce students to the field by covering state-of-the-art modeling, analysis and visualization techniques.
- In order to successfully design and build scalable systems on clouds, a range of knowledge and skills are needed.
- This module will introduce and examine cloud computing. Methods for building scalable cloud applications will be described and explained.
- Also course will provide a solid foundation of the theoretical and practical aspects of the different dimensions of IT/cyber security, such as network security, software security, system security measures and models, information security, computer forensics, penetration testing and vulnerability assessment.

Course Learning Outcomes:

- interpret what goes behind the processing of huge volumes of data and real-time analytics
- Characteristics and General Benefits and Architecture of Cloud Computing and XaaS Cloud Based Service Offerings.
- Understand Cloud Service & Deployment Models, Infrastructure, and Consumer View. Design basic Cloud Applications
- Able to describes to how to identify, mitigate and prevent cyber security threats
- Able to respond to security incidents for government agencies and corporate organizations.

I YEAR (LEADING TO CERTIFICATE)

PAPER	Instruction (Hr)	Duration of Examination (Hr)	Marks for Final Exam	Marks for Internal Exam	Total Marks
CDCCS Paper-I	03	03	100	50	150
Practical-I	03	03	100	50	150

Every student is expected to maintain a record book comprising minimum of five assignments from the syllabus or related areas each of 10 marks. (5*10=50). Every student should undergo a viva voce examination based on the record book and syllabus for a maximum of 50 marks.

50 Marks of internal can be allotted by the concerned teachers based on assignment presentations and class performance.

II YEAR (LEADING TO DIPLOMA)

PAPER	Instruction (Hr)	Duration of Examination (Hr)	Marks for Final Exam	Marks for Internal Exam	Total Marks
DDCCS Paper-II	03	03	100	50	150
Practical-II	03	03	100	50	150

Every student is expected to maintain a record book comprising minimum of five assignments from the syllabus or related areas each of 10 marks. (5*10=50). Every student should undergo a viva voce examination based on the record book and syllabus for a maximum of 50 marks.

50 Marks of internal can be allotted by the concerned teachers based on assignment presentations and class performance.

III YEAR (LEADING TO ADVANCED DIPLOMA)

PAPER	Instruction (Hr)	Duration of Examination(Hr)	Marks for Final Exam	Marks for Internal Exam	Total Marks
ADDCCS Paper-III	03	03	100	50	150
Practical-III	03	03	100	50	150
Project	03	Viva vice	100	-	100

Every student is expected to maintain a record book comprising minimum of five assignments from the syllabus or related areas each of 20 marks. (5*20=100).

50 Marks of internal can be allotted by the concerned teachers based on assignment presentations and class performance.

Every student is expected to take up a project work under a teacher guide relating to the areas of their study and submit a report containing a minimum of 50 pages which will have two valuations (1 internal and 1 external) for a maximum of 50 marks. A viva voce examination to be conducted based on their project report by the external examiner/examiners for a maximum of 50 marks.

Methodology

- Tutorial and Group Discussion
- Practical Experience
- Projects and Assignments
- Course Presentation
- Industrial Visit
- Seminars and Workshops

1st YEAR

DATA ANALYSIS, CLOUD COMPUTING AND CYBER SECURITY-CDCCS

CHAPTER1: Data analysis introduction

1.1 Data analysis basic concept

1.2 different types of data analysis

1.3 Systematic procedure

1.4 basic history and overview.

CHAPTER2: Hadoop MapReduce and YARN framework

2.1 Introduction to MapReduce

2.2 Processing data with Hadoop using MapReduce

2.3 Introduction to YARN, Components

2.4 Need and Challenges of YARN

2.5 Dissecting YARN, MapReduce application

2.6 Data serialization and Working with common serialization formats, Big data serialization formats

CHAPTER3: Cloud computing

1.1 Introduction, definition

1.2 overview, basic concept with technology

1.3 Application and service provider of server.

CHAPTER4 : Cyber security Overview

1.1 Introduction and Security from Global Perspective

1.2 Trends in the Types of Attacks and Malware

1.3 The types of Malware

1.4 The attackers motivation and tactics

1.5 Network and Infrastructure Overview

1.6 **FireWalls and** Stateless Packet Filtering

1.7 Statefull or session Filtering, Application level Gateways

1.8 Circuit level Gateways, A Comparison of Four types of gateways.

Textbook

1. **Introduction to Computer Networks and Cyber security –** Chwan-Hwa (John) Wu (Author), J. David Irwin (Author).publication: : CRC press, Taylor and Francis group.2013 (for UNIT 1 & II)
2. David Loshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", 2013.
3. *Cyber Security* –Nina godbole, Sunit Belapure, Publication :John Wiley.2012 (for unit III & VI)
4. 1.“Cloud Computing Explained” by John Rhoton, ISBN-10: 0956355609, ISBN-13: 978-0956355607.

References

1. “Cloud Computing for Programmers” by Daniele Casal 5. “Cloud Computing For Dummies” by Judith Hurwitz, ISBN-13: 978-0470484708 ISBN10: 0470484705
2. Jure Leskovec, Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2014.
3. Tom White , Hadoop: The Definitive Guide, 4th edition O’Reily Publications, 2015

2nd YEAR

DATA ANALYSIS, CLOUD COMPUTING AND CYBER SECURITY-DDCCS

CHAPTER 1: Big data analytics

1.1 Introduction & Overview of business intelligence

1.2 Data science and Analytics

1.3 Meaning and Characteristics of big data analytics

1.4 Need of big data analytics

1.5 Classification of analytics

1.6 Challenges to big data analytics

1.7 Importance of big data analytics

1.8 Basic terminologies in big data environment

CHAPTER 2:Cloud Computing Architecture

2.1 Infrastructure, Platforms and Software

2.2 Cloud Platform Components for Processing and Storage

2.3 Virtual Machines

2.4 Scalable Computing Patterns for the Cloud

2.5 Cloud Computing Case Studies.

CHAPTER 3: Cloud Computing Architecture

3.1 Cloud computing stack

3.2 Comparison with traditional computing architecture (client/server)

3.3 Services provided at various levels

3.4 How Cloud Computing Works

3.5 Role of Networks in Cloud computing

3.6 protocols used, Role of Web services, Service Models (XaaS

3.7 Deployment Models, Public cloud, Private cloud, Hybrid cloud, Community cloud

CHAPTER 4: Intrusion Detection / Prevention System

4.1 The approaches used for IDS/ IPS

4.2 Network Based IDS/IPS

4.3 Host Based IDS/IPS

4.4 The detection of Polymorphic and metamorphic worms

4.5 Distributed Intrusion Detection system and standard

Textbook

1. EMC Education Services, "Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", Wiley publishers, 2015.
2. “Cloud Computing: Concepts, Technology & Architecture” by Thomas Erl, ISBN: 9780133387568.
3. *Cyber security essentials* --Edited by James Graham, Richard Howard, Ryan Olson, publication: CRC press, Taylor and Francis group.2011(for Unit V)
4. “The Little Book of Cloud Computing” by Lars Nielsen, ISBN-10: 0615924220, ISBN13: 978-0615924229

References

1. Dietmar Jannach, Markus Zanker, Alexander Felfernig and Gerhard Friedrich "Recommender Systems: An Introduction", Cambridge University Press, 2010.
2. Kim H. Pries and Robert Dunnigan, "Big Data Analytics: A Practical Guide for Managers " CRC Press, 2015.
3. Jimmy Lin, Chris Dyer and Graeme Hirst, "Data-Intensive Text Processing with MapReduce", Synthesis Lectures on Human Language Technologies, Vol. 3, No. 1, Pages 1-177, Morgan Claypool publishers, 2010.

3rd YEAR

DATA ANALYSIS, CLOUD COMPUTING AND CYBER SECURITY-ADDCCS

CHAPTER1 : NoSQL Databases

1.1 Schema less ModelsIncreasing

1.2 Flexibility for Data ManipulationKey Value Stores

1.3 Document Stores

1.4 Tabular Stores

1.5 Object Data Stores

1.6 Graph Databases

1.7 Big data for twitter

1.8 Big data for E-Commerce blogs

CHAPTER 2: Service Management in Cloud Computing

2.1 Service Level Agreements(SLAs)

2.2 Billing & Accounting

2.3 Comparing Scaling Hardware

2.4 Traditional vs. Cloud

2.4 Economics of scaling.

2.5 Cloud Security

2.6 Data security and Storage

CHAPTER 3: Hash and Authentication

3.1 Authentication overview

3.2 Hash Functions

3.3 The Hash Message Authentication Code, Password Based Authentication

3.4 Password Based Encryption Standard

3.5 Password Based Security Protocols, One time password and tokens(only two factor authentication)

3.6 Open Identification and Open Authorization.

CHAPTER 4: Phishing and Identity theft

4.1 Introduction, Phishing , Identity theft (ID)

4.2 Cyber Crime and Cyber Security

4.3 Why do we need cyber laws

4.4 Indian context, The Indian IT Act

4.5 Challenges to Indian Law and cyber crime scenarios in India

4.6 Consequences of not addressing the weakness in information technology Act.

4.7 Digital Signatures and Indian Act. Cyber Crime and Punishment

Text Books:

1. *Cyber security essentials* --Edited by James Graham, Richard Howard, Ryan Olson, publication: CRC press, Taylor and Francis group.2011(for Unit V)
2. "The Little Book of Cloud Computing" by Lars Nielsen, ISBN-10: 0615924220, ISBN13: 978-0615924229
3. 5. Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", Wiley Publishers, 2015.

References

1. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010
2. Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wile, 2011
3. Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012
4. Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley-India, 2010