ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ

MANGALORE UNIVERSITY

(Accredited by NAAC with 'A' Grade)

ಕ್ರಮಾಂಕ/ No. : MU/ACC/CR 41/2020-21/A2

ಕುಲಸಚಿವರ ಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ – 574 199
Office of the Registrar
Mangalagangothri – 574 199
ದಿನಾಂಕ/Date:20.11.2020

NOTIFICATION

Sub: Syllabus of Career Oriented programme in Artificial Intelligence, Big Data Analytics and Cyber Security.
Ref: Academic Council approval vide agenda No.:ಎಸಿಸಿ:ಶೈ.ಸಾ.ಸ.1:21 (2020–21) dtd 06.10.2020.

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The syllabus Career Oriented programme in Artificial Intelligence, Big Data Analytics and Cyber Security which has been approved by the Academic Council at its meeting held on 06.10.2020 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

20/11

To,

1. The Principals of the Colleges concerned.
2. The Chairman, UG combined BOS in Computer and BCA, 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.

MANGALORE UNIVERSITY
Certificate, Diploma, Advanced Diploma

I Year (Certificate Course)
Certification program on Artificial Intelligence, Big Data Analytics and Cyber Security

Paper	Instruction (Hours)	Duration of examination (Hours)	Marks for Final Exam	Marks for Internal Exam	Total mark
Paper I	3	3	100	50	150
Practical	3		100		100
Viva				50	50
	Total				**300**

II Year (Diploma)
Diploma in Artificial Intelligence, Big Data Analytics and Cyber Security

Paper	Instruction (Hours)	Duration of examination (Hours)	Marks for Final Exam	Marks for Internal Exam	Total mark
Paper I	3	3	100	50	150
Practical	3		100		100
Viva				50	50
	Total				**300**

III Year (Advanced Diploma)
Advanced Diploma in Artificial Intelligence, Big Data Analytics and Cyber Security

Paper	Instruction (Hours)	Duration of examination (Hours)	Marks for Final Exam	Marks for Internal Exam	Total mark
Paper I	3	3	100	50	150
Project Work	3		100	50	150
Viva				100	100
	Total				**400**

I Year (Certificate Course)

Certification program on Artificial Intelligence, Big Data Analytics and Cyber Security

Duration	72 hours consists of 6 chapters. Each chapter will have 12hours
Objective	To understand the fundamentals of Artificial Intelligence, Big Data Analytics & Cyber Security.
Learning Outcome	Students will be able to learn the various searching strategies of AI, online search agents, Optimization Problems etc., Credits and Risks of Big data, various categories of cyber offenses and laws.

Chapter 1.1 : Introduction, Intelligent Agents

What is API? The foundations of artificial intelligence, The history of artificial intelligence, Agents and environments, Good behavior: the concept of rationality, The nature of environments, The structure of agents (12 Hours)

Chapter 1.2 : Problem Solving

Problem solving Agent, Uniformed Search Strategies, Avoiding Repeated states, Searching with Partial Information, Informed Search Strategies, Heuristic Functions, Local search algorithms and Optimization Problems, Local Search in Continuous Spaces, Online Search Agents and Unkown Environments. (12 Hours)

Chapter 1.3: Meaning of Big Data, Importance of Data Analytics

A flood of Mythic "start-up" Proportions, Big Data is more than Merely Big, Why now?, A convergence of key Trends, Relatively Speaking…A wider variety of Data, The expanding universe of unstructured data, setting the tone at the top. (12 Hours)

Chapter 1.4: Industry examples of Big DATA

Digital Marketing and Non-Line World, Don't Abdicate Relationships, Is IT losing Control of web Analytics?, Database marketers, pioneers of big data, big data and the new school of Marketing, Fraud and big data, RISK and big data, credit risk management, big data and algorithm trading, Big data and Advances in Health care (12 Hours)

Chapter 1.5:**Introduction to Cybercrime and Cyberoffenses and Cybercrime on mobile**

Basics of cybercrime, Cybercrime Trend, Cybercrime and Information Security,Cybercriminals, Classifications of cybercrime, Cyberdefamation, Categories of Cybercrime, Active Attacks, Passive Attacks, Social Engineering, Cyberstalking, Cyber-attacks on mobile , Security measurements on portable device(12 Hours)

Chapter 1.6:Cybercrime in action, Computer Forensics, Cybercrime and Cyber security with legal perspective

Tools and Methods used in cybercrime, Phishing and identity theft. Digital Forensic Science, The need of Computer forensics, Types of Digital Forensics, Cyber forensic and digital evidence, Digital forensic life cycle, Steganography, Forensics and Social Networking sites, Computer forensic challenges, Cybercrime and the legal landscape, Cybercrime scenario in India, The Indian

IT Act,Amendments to the Indian IT act, Cybercrime and Punishment(12 Hours)

Syllabus for Practical

Subject :Artificial Intelligence Laboratory (Using PROLOG)

Duration	40 hours consists of 10 programs. Each program with 10 marks including Record Evaluation
Objective	Students will be able to learn concepts of Artificial Intelligence using PROLOG

Artificial Intelligence Laboratory (Using PROLOG)

Sl.No	Program
	Study of PROLOG
1.	Program to add two numbers
2.	Program to categorize animal characteristics.
3.	Program to read address of a person using compound variable
4.	Program to count number of elements in a list
5.	Program to reverse the list
6.	Program to append an integer into the list
7.	Program to replace an integer from the list
8.	Program to show concept of list.
9.	Program to show how integer variable is used in prolog program
10.	Program to demonstrate family relationship

Books for Reference :

1. Artificial Intelligence: A Modern Approach,. Russell &Norvig. 1995, Prentice Hall.
2. Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
3. Artificial Intelligence-A modern approach, StaurtRussel and peter norvig, 1998, PHI.
4. Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3 Ed.,

II year Diploma

Syllabus for Theory

Basics of Artificial Intelligence, Big Data Analytics and Cyber Security

Duration	72 hours consists of 6 chapters. Each chapter will have 12 hours
Objective	To understand the fundamentals of Artificial Intelligence, Big Data Analytics & Cyber Security
Learning Outcome	Students will be able to learn the concepts of proportional logic and reasoning in AI, Analytics & Data collection in Big Data Analytics, Different security risks and anonymous networks in Cyber security

Chapter 2.1: Knowledge and reasoning

Logical Agents, Reasoning Patterns in Propositional logic, Effective propositional inference, Agents based on Propositional logic, Syntax and Semantics of First Order logic, using first order logic, knowledge engineering in First-Order logic (12 Hours)

Chapter 2.2 : Knowledge representation

Ontological engineering, Categories and Objects, Action, Situations and Events, Mental events and Mental object ,Internet Shopping world, Reasoning systems for categories, Reasoning with Default Information (12 Hours)

Chapter 2.3: Big data Technologies

Big Data Technology Hadoop's Parallel World – Data discovery – Open source technology for Big Data Analytics – cloud and Big Data –Predictive Analytics – Mobile Business Intelligence and Big Data – Crowd Sourcing Analytics – Inter- and Trans-Firewall Analytics (12 Hours)

Chapter 2.4: Data collection sampling and preprocessing

Types of data sources, sampling, Types of data elements, visual Data Exploration and exploratory statistical analysis, Missing values, Outlier Direction and treatment, standardizing data, categorization, weights of evidence coding, variable selection (12 Hours)

Chapter 2.5:Digital Securities

Introduction, Types of Attacks, Digital Privacy, Online Tracking, Privacy Laws, Types of Computer Security risks (Malware, Hacking, Pharming, Phishing, Ransomware, Adware and Spyware, Trojan, Virus, Worms, WIFI Eavesdropping, Scareware, Distributed Denial-Of-Service Attack, Rootkits, Juice Jacking), Antivirus and Other Security solution, Password, Secure online browsing, Email Security, Social Engineering, Secure WIFI settings, Track yourself online, Cloud storage security, IOT security, Physical Security Threads (12 Hours)

Chapter 2.6:Online Anonymity

Anonymous Networks, Tor Network, I2P Network, Freenet, Darknet, Anonymous OS – Tails, Secure File Sharing, VPN, Proxy Server, Connection

Leak Testing, Secure Search Engine, Web Browser Privacy Configuration, Anonymous Payment (12 Hours)

Syllabus for Practical

Subject :Cyber Security

Duration	40 hours consists 7 programs 10 marks each with Record Evaluation and Mini Project (Case study) 30 marks
Objective	Students will be able to learn concepts of Artificial Intelligence using PROLOG

Cyber Security Laboratory

Sl.No	Program
1.	Perform Port Scanning using Nmap(Network Mapper)
2.	Analyze the Network Traffic using Wireshark.(Network Sniffer)
3.	Collect the owner's private information using Keylogger (Spyware)
4.	Perform Data Hiding Technique using OpenStego(Covered Writing)
5.	Identification of Virus infected file using virustotal.com
6.	Understanding the Traceroute functionally (Graphical Way) using Open Visual Traceroute.
7.	Vulnerability Analysis in Web Application using Zed Attack Proxy.
	Mini Project
8.	Case Study on (15 x 2 =30 marks) 1. Indian IT Act 2000 2. Cyber Attack/ Cyber Crime(we can specify latest virus/worm)

III year Advanced Diploma

Syllabus for Theory

Advanced Diploma in Artificial Intelligence, Big Data Analytics and Cyber Security

Duration	72 hours consists of 6 chapters. Each chapter will have 12 hours
Objective	To understand the fundamentals of Artificial Intelligence, Big Data Analytics & Cyber Security
Learning Outcome	Students will be able to learn the concepts of planning and reasoning in AI, Hadoop and Regression Techniques, Cryptographic functions and Digital Forensics

Chapter 3.1 : Planning

The planning Problem, Planning with State-Space Search, Partial Order Planning, Planning Graphs, Planning with propositional Logic, Hierarchical Task Network Planning, Planning and Acting in Nondeterministic Domains, Conditional Planning , Continuous Planning, MultiAgent Planning (12 Hours)

Chapter 3.2: Uncertain Knowledge and reasoning

Uncertainty: Acting under uncertainty, Basic Probability Notation, The Axioms of Probability, Bayes Rule and its use, Representing knowledge in Uncertain Domain, The semantics of Bayesian networks, Exact inference in Bayesian Networks, Approximate Inference in Bayesian Networks (12 Hours)

Chapter 3.3: Understanding the basics of MapReduce

Introducing HadoopMapReduce, listing HadoopMapReduce Entities, Understanding the HadoopMapReduce scenario, understanding the limitations of MapReduce, Understanding Hadoop's ability to solve problems, Understanding the different Java concepts used in Hadoop programming (12 Hours)

Chapter 3.4: Predictive analytics

Targetdefinition,linearregression, logistic regression,DecisionTree,NeuralNetworks,Support vector machines, ensemble methods, multiclass classification techniques, evaluating predictive models (12 Hours)

Chapter 3.5:Cryptography and Secure Communication

The Difference Between Encryption and Cryptography, Cryptographic Functions, Cryptographic Types, Digital Signature, The Difference Between Digital Signatures and Electronic Signatures, Cryptographic Systems Trust Models, Disk Encryption Using Open Source Tools, Multitask Encryption Tools, Attacking Cryptographic Systems, Countermeasures Against Cryptography Attacks, Securing Data in Transit, Encrypt DNS Traffic and Email communication, Secure IM and video calls (12 Hours)

Chapter 3.6:Digital Forensics

Introduction to Digital Forensics, Forensic Software and Hardware, Analysis and Advanced Tools, Forensic Technology and Practices, Forensic Ballistics and Photography, Face, Iris and Fingerprint Recognition, Audio Video

Analysis, Windows System Forensics, Linux System Forensics, WIFI Security (War-driving), Network Forensics, Mobile Forensics, Cloud Forensics (12 Hours)

Syllabus for Project Work

Student can take up any real time project work based on any of these following areas:

1. Artificial Intelligence
2. Big Data Analytics
3. Cyber Security.

Text Books:

1. Stuart Russel, Peter Norvig: Artificial Intelligence A Modern Approach, Pearson 2nd edition 2013.
2. Elaine Rich, Kevin Knight, Shivashankar B Nair: Artificial Intelligence, Tata McGraw Hill 3rd edition. 2013
3. Nils J. Nilsson: "Principles of Artificial Intelligence", Elsevier, ISBN-13: 9780934613101
4. Analytics Big Data World: The essential guide to data science and its application by Bart Baesens,2014
5. Big Data Big Analytics: by Michael Minelli,Michele Chambers,AmbigaDhiraj, 2018
6. Big data Analytics with R and Hadoop:Vigneshprajapathi, second edition, 2014
7. Cyber Security : Understanding Cyber Crimes , Computer Forensics and Legal Perspectives By Nina Godbole, SunitBelapur , Wiley
8. Cyber Security for Beginners by RaefMeeuwisse ,Cyber Simplicity Ltd.
9. Digital Privacy and Security Using Windows: A Practical Guide By Nihad Hassan, Rami Hijazi, Apress