BCA - AI and Data Analytics

PROGRAM DETAILS

Faculty	Computing and IT (FCIT)
School	School of Computer Application (SCA)
Program	BCA-AI and Data Analytics
Dean of Faculty	Dr. Shweta Marigoudar
Director of School	Ms. Shamina M.Attar

1	**Title of the Award**	BCA-AI and Data Analytics
2	**Modes of Study**	Full Time
3	**Awarding Institution /Body**	GM University
4	**Joint Award**	Not Applicable
5	**Teaching Institution**	Faculty of Computing and IT (FCIT)
6	**Date of Program Specifications**	November -2023
7	**Date of Course Approval by the Academic Council of GMU**	---
8	**Next Review Date:**	---
9	**Program Approving Regulating Body and Date of Approval**	---
10	**Program Accredited Body and Date of Accreditation**	---
11	**Grade Awarded by the Accreditation Body**	---
12	**Program Accreditation Validity**	---
13	**Program Benchmark**	N/A
14	**Program Overview:** BCA in AI and Data Analytics The BCA in AI and Data Analytics is a cutting-edge program designed to equip students with the skills and knowledge necessary to harness the power of artificial intelligence and data analytics. Spanning three to four years, this interdisciplinary program integrates principles from computer science, machine learning, statistics, and data science. Students engage in a comprehensive curriculum covering foundational concepts such as programming, algorithm design, statistical analysis, and machine learning algorithms. The program places a strong emphasis on practical applications, allowing students to work on real-world projects and gain hands-on experience with large datasets. Core courses delve into topics such as data mining, natural language processing, and predictive modelling, ensuring graduates are well-versed in the latest technologies and methodologies. Proficiency in programming languages like Python and R is a key focus, enabling students to implement and optimize AI and data analytics solutions.	

	Upon completion, graduates are prepared for diverse roles in industries where data-driven decision-making and artificial intelligence are paramount. The program aims to produce professionals who not only excel in technical skills but also possess a deep understanding of the ethical considerations and societal implications of AI and data analytics.
15	**Program Educational Objectives (PEOs) for Bachelor's Program in AI and Data Analytics:** **1. Proficient Data Analysis and AI Application:** • Graduates will demonstrate proficiency in collecting, cleaning, and analyzing diverse datasets, applying statistical and machine learning techniques to derive actionable insights and implement AI solutions. **2. Effective Problem Solvers and Innovators:** • Graduates will excel in problem-solving and critical thinking, applying logical reasoning and innovative approaches to address complex challenges in the fields of AI and data analytics. **3. Ethical AI Practitioners with Effective Communication Skills:** • Alumni will possess strong ethical foundations, applying responsible AI practices and demonstrating awareness of ethical considerations. They will communicate technical concepts clearly to diverse audiences, fostering collaboration and ensuring responsible use of AI and data analytics technologies.
16	**Program Outcomes (POs) for Bachelor's Program in AI and Data Analytics:** **1. Data Analysis Proficiency:** • *Outcome:* Graduates will demonstrate advanced proficiency in collecting, cleaning, and analyzing diverse datasets using statistical and machine learning methods to derive meaningful insights. **2. Machine Learning Application Competence:** • *Outcome:* Graduates will apply a range of machine learning algorithms to address real-world problems, showcasing competence in supervised and unsupervised learning techniques. **3. Effective Data Visualization and Communication:** • *Outcome:* Graduates will communicate complex technical findings effectively through clear data visualizations, reports, and presentations, catering to both technical and non-technical stakeholders. **4. Programming and Algorithmic Skills:** • *Outcome:* Graduates will exhibit advanced programming skills and algorithmic competence, optimizing AI and data analytics solutions using contemporary languages and methodologies. **5. Big Data Handling and Technologies:** • *Outcome:* Graduates will apply principles of distributed computing and utilize big data Technologies, demonstrating proficiency in handling large-scale datasets common in AI and data analytics scenarios. **6. Ethical AI Practices:** • *Outcome:* Graduates will uphold ethical standards in AI practices, demonstrating awareness of legal and ethical implications related to AI and data analytics technologies.

	7. Innovative Problem Solvers: • *Outcome:* Graduates will showcase innovative problem-solving skills, applying logical reasoning and creative approaches to address novel challenges in AI and data analytics. **8. Industry-Relevant Project Experience:** • *Outcome:* Graduates will apply theoretical knowledge in practical settings through hands-on projects, ensuring they are well-prepared for the demands of the professional landscape in AI and data analytics.
17	**Program Specific Outcomes (PSOs) for Bachelor's Program in AI and Data Analytics:** **1. Advanced AI Implementation Proficiency:** *PSO:* Graduates will demonstrate advanced proficiency in implementing artificial intelligence solutions, applying a diverse range of algorithms and models to address complex challenges in real- world scenarios. **2. Specialized Data Analytics Competence:** *PSO:* Graduates will exhibit specialized skills in data analytics, including advanced techniques in statistical analysis, data mining, and predictive modelling to derive actionable insights from diverse datasets. **3. Effective Design and Evaluation of AI Systems:** *PSO:* Alumni will possess the ability to design and evaluate artificial intelligence systems, showcasing competence in system architecture, algorithm selection, and performance evaluation to ensure effective AI solutions.

Programme Structure

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
2 Hr. Tutorial (T) per week	1 Credit
2 Hr. Practical (P) per week	1 Credit

Sl. No.	Program -Category	Credits
1	Program-Core courses, elective Courses, open electives	100/130
2	Technical Skills	10 (SDTCD)
3	Life Skills	3(CASP)
4	Innovation and Entrepreneurial Skills	3(CIPI)
5	Environmental Awareness and Community Services	3(SA)
6	Athletics, Sports, Yoga, Gymnasium	3(SA)
7	Cultural & Literary Activities	3(SA)
8	Co-Curricular Activities (Seminar/Conference/Exhibition/Technical Competition)	2(SA&SP)
9	Placement Training	3(CASP)
	Total	**130+30=160**

3-year degree program: 100 + 30= 130

4 Year Honors Program: 130+30= 160

18. Courses and Credits:

Semester-1			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UL24FHK11 UL24FHH13	Kannada Siri-1 Katha Saritha	**02**
2	UL24FHE12	Insight-1	**02**
3	UC24AI1104	C Programming	**03**
4	UC24AI1105	C Programming Lab	**02**
5	UC24AI1106	Computer Fundamental	**03**
6	UC24AI1107	Computer Fundamental Lab	**02**
7	UC24AI1108	Mathematical Foundation	**03**
8	UM24BC1142	OEC-1	**03**
9	UC24HGT11	Technical Skills	00
10	UC24HGL12	Life Skills	00
11	UC24HGE13	Innovation and Entrepreneurial Skills	00
12	UC24HGV14	Environmental Awareness and Community Services	00
13	UC24HGA15	Athletics, Sports, Yoga, Gymnasium	01
14	UC24HGC16	Cultural & Literary Activities	00
15	UC24HGR17	Co-Curricular Activities (Seminar/Conference/Exhibition/Technical Competition)	00
16	UC24HGP18	Placement Training	00
Total			**21**

Semester-2			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UL24FHK21 UL24FHH23	Kannada Siri-2 Katha Sourabha	**02**
2	UL24FHE22	Insight– 2	**02**
3	UC24AI1204	Programming Fundamental using C++	**03**
4	UC24AI1205	C++ Lab	**02**
5	UC24AI1206	Data Structures using C++	**03**
6	UC24AI1207	Data Structures Lab	**02**
7	UM24BC1241	OEC-2	**03**
8	UC24HGT21	Technical Skills	02
9	UC24HGL22	Life Skills	00
10	UC24HGE23	Innovation and Entrepreneurial Skills	00
11	UC24HGV24	Environmental Awareness and Community Services	01
12	UC24HGA25	Athletics, Sports, Yoga, Gymnasium	01
13	UC24HGC26	Cultural & Literary Activities	00
14	UC24HGR27	Co-Curricular Activities (Seminar/Conference/Exhibition/Technical Competition)	00
15	UC24HGP28	Placement Training	00
Total			**21**

Semester-3			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UC24AI2301	Programming in JAVA	**03**
2	UC24AI2302	Programming in JAVA Lab	**02**
3	UC24AI2303	Data Base System Concepts	**03**
4	UC24AI2304	Data Base System Lab	**02**
5	UC24AI2305	Fuzzy Logic and Neural Network	**03**
6	UC24AI2306	Introduction to IOT	**03**
7	UM24BC2341	OEC-3	**03**
8	UC24HGT31	Technical Skills	02
9	UC24HGL32	Life Skills	00
10	UC24HGE33	Innovation and Entrepreneurial Skills	01
11	UC24HGV34	Environmental Awareness and Community Services	00
12	UC24HGA35	Athletics, Sports, Yoga, Gymnasium	00
13	UC24HGC36	Cultural & Literary Activities	00
14	UC24HGR37	Co-Curricular Activities (Seminar/Conference/Exhibition/TechnicalCompetition)	01
15	UC24HGP38	Placement Training	00
Total			**23**

Semester-4			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UC24AI2401	Introduction to AI	**03**
2	UC24AI2402	Representations of AI Lab	**02**
3	UC24AI2403	Python Programming	**03**
4	UC24AI2404	Python Programming Lab	**02**
5	UC24AI2405	Fundamentals of Machine Learning	**03**
6	UC24AI2406	Software Engineering	**03**
7	UC24HGT41	Technical Skills	02
8	UC24HGL42	Life Skills	02
9	UC24HGE43	Innovation and Entrepreneurial Skills	00
10	UC24HGV44	Environmental Awareness and Community Services	01
11	UC24HGA45	Athletics, Sports, Yoga, Gymnasium	00
12	UC24HGC46	Cultural & Literary Activities	01
13	UC24HGR47	Co-Curricular Activities (Seminar/Conference/Exhibition/TechnicalCompetition)	00
14	UC24HGP48	Placement Training	01
Total			**23**

Semester-5			
S. No.	**Course Code**	**Course Title**	**Credits**
1	UC24AI3501	Big Data Analytics	**03**
2	UC24AI3502	Big Data Analytics Lab	**02**
3	UC24AI3503	Data Visualization	**03**
4	UC24AI3504	Data Visualization Lab	**02**
5	UC24AI3505	Design and analysis of Algorithm with Integrated Lab	**04**
6	UC24AI3506	Embedded Systems	**03**
7	UC24HGT51	Technical Skills	02
8	UC24HGL52	Life Skills	01
9	UC24HGE53	Innovation and Entrepreneurial Skills	01
10	UC24HGV54	Environmental Awareness and Community Services	00
11	UC24HGA55	Athletics, Sports, Yoga, Gymnasium	01
12	UC24HGC56	Cultural & Literary Activities	00
13	UC24HGR57	Co-Curricular Activities (Seminar/Conference/Exhibition/TechnicalCompetition)	01
14	UC24HGP58	Placement Training	01
Total			**24**

Semester-6			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UC24AI3601	Artificial Neural Network	**03**
2	UC24AI3602	Deep Learning	**03**
3	UC24AI3603	Project Work	**05**
4	UC24HGT61	Technical Skills	02
5	UC24HGL62	Life Skills	01
6	UC24HGE63	Innovation and Entrepreneurial Skills	01
7	UC24HGV64	Environmental Awareness and Community Services	00
8	UC24HGA65	Athletics, Sports, Yoga, Gymnasium	01
9	UC24HGC66	Cultural & Literary Activities	00
10	UC24HGR67	Co-Curricular Activities (Seminar/Conference/Exhibition/Technical Competition)	01
11	UC24HGP68	Placement Training	01
Total			**18**

Semester-7			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UC24AI4701	Research Methodology and IPR	**03**
2	UC24AI4702	Research Paper - 1	**03**
3	UC24AI4703	Internship	**08**
4	UC24HGT71	Technical Skills	00
5	UC24HGL72	Life Skills	00
6	UC24HGE73	Innovation and Entrepreneurial Skills	00
7	UC24HGV74	Environmental Awareness and Community Services	00
8	UC24HGA75	Athletics, Sports, Yoga, Gymnasium	00
9	UC24HGC76	Cultural & Literary Activities	00
10	UC24HGR77	Co-Curricular Activities (Seminar/Conference/Exhibition/TechnicalCompetition)	00
11	UC24HGP78	Placement Training	00
		Total	**14**

Semester-8			
Sl. No.	**Course Code**	**Course Title**	**Credits**
1	UC24AI4801	Industrial Excursion	**03**
2	UC24AI4802	Research Paper - 2	**03**
3	UC24AI4803	Dissertation	**10**
4	UC24HGT81	Technical Skills	00
5	UC24HGL82	Life Skills	00
6	UC24HGE83	Innovation and Entrepreneurial Skills	00
7	UC24HGV84	Environmental Awareness and Community Services	00
8	UC24HGA85	Athletics, Sports, Yoga, Gymnasium	00
9	UC24HGC86	Cultural &S Literary Activities	00
10	UC24HGR87	Co-Curricular Activities (Seminar/Conference/Exhibition/TechnicalCompetition)	01
11	UC24HGP88	Placement Training	00
		Total	**16**

List of **Open Elective Courses** Offered:

1. **Semester – 1:** Fundamentals of Computers
2. **Semester – 2:** Digital Fluency
3. **Semester – 3:** Internet Security

19	**Program Delivery and Program Attainment** The program comprises several courses, each delivered according to the specifications outlined in the course documents. At the conclusion of each course, both course attainments and program attainments are computed. These attainments undergo analysis during Course Assessment Board and Program Assessment Board meetings, leading to recommendations for enhancements in subsequent offerings.
20	**Teaching and Learning Methods** 1. Face to Face Lectures using Audio-Visuals 2. Laboratory work/Fieldwork/Workshop 3. Project Based Learning 4. Problem Based Learning 5. Group Exercises/Assignments 6. Demonstrations 7. Guest Lectures 8. Industry Visit 9. Workshops, Group Discussions, Debates, Presentations 10. Project Work 11. Project Exhibitions 12. Technical Competitions
21	**Attendance** A minimum of 85% attendance is essential to appear for semester end examinations. Condoning of Attendance shortage is as per the Academic Regulations of BCA Programme.
22	**Assessment and Grading** 1. Every course will be assessed for a weight of 100 2. There are 4 components: a. Quiz -15% b. Class Tests: 25% c. Application Based open assignments/ Activity/project-based learning/problem-based learning and any such assessment: 20% d. Semester End Examination: 40% 3. Based on total marks scored grade is Awarded. If marks scored is: • 91 and above O (outstanding); 81- 90: A+ (Excellent); 71-80: A (Very Good); 61-70: B+ (Good); 51-60 : B (Above Average); 40 -50: C (Average); below 40: D (Not satisfactory) • If one scores D grade, the candidate is required to re-register for the course (for core courses only, students can exercise their choice in case of electives or open electives means they can re-register or register for a different elective course) and earn the required credits • **A minimum of overall 40% is required for completion of course by acquiring minimum grade (pass) with a minimum of 40% in each component.** 4. End of each semester grade card will be issued with SGPA displayed

23	**Award of Degree** Every student registering for the program need to complete a **minimum of 120 credits for the award of Bachelor's degree and 160 credits for the award of honors degree**. **Award of Degree Certificate:** Students will be issued consolidated grade card with CGPA displayed and GM University Degree Certificate. **Award of Gold Medal:** A student with highest CGPA (Not less than 9.0 on a scale of 10) in the class without getting a D grade in any Course over 6/8 semester and completing the program within the specified period of 3/4 years (6/8 semesters) will be awarded Gold Medal.
24	**Student Support for Learning** 1. Course Notes 2. Reference Books in the Library 3. Magazines and Journals 4. Internet Facility 5. Computing Facility 6. Laboratory Facility 7. Workshop Facility 8. Staff Support 9. Lounges for Discussions 10. Any other support that enhances their learning
25	**Quality Control Measures** 1. Review of Course Notes 2. Review of Question Papers and Assignment Questions 3. Student Feedback 4. Moderation of Assessed Work 5. Opportunities for students to see their assessed work 6. Review by external examiners and external examiners reports 7. Staff Student Consultative Committee meetings 8. Student exit feedback 9. Course Assessment Board (CAB) 10. Programme Assessment Board (PAB)

26. **Mapping of POs with Cos.**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Course-1												
CO1												
CO2												
CO3												
CO4												
CO5												
CO6												
Course-2												
CO1												
CO2												
CO3												
CO4												
CO5												
CO6												