Hindi Vidya Prachar Samiti's

Ramniranjan Jhunjhunwala College of Arts, Science & Commerce (Autonomous), Ghatkopar (W)

Affiliated to

University of Mumbai

Syllabus Framework as per LOCF

Program: M.Sc. Data Science & Artificial Intelligence
Program Code: RJSPGDSAI

Choice Based Credit System Syllabus

(With effect from the academic year 2020-21)

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The Preamble

Why DSAI?

Change is the only constant in the world, even so, in the world of technology. Industry, academics, healthcare, life sciences, economy, hospitality all the sectors are data driven. Analysis, estimation and prediction of data have become back bone of many businesses globally. Data science industry is rapidly growing, and along with it, the need of data scientists is also increasing. To cater to this need, formal education in the field of data science becomes need of the hour.

Artificial Intelligence, on the other hand is a gateway to increase the efficiency of these areas. Artificial Intelligence facilitates automation and reduces the human efforts in redundant tasks. With humongous amount of data getting generated every minute, the data processing and analytics must be done with help of smarter and more intelligent devices. This task is handled very effectively by AI systems. For this reason, the combination of Data Science and Artificial Intelligence becomes an all-inclusive combination to facilitate the learner to be expert to build a smart solution of data analysis field.

Why DSAI at R J College?

The MSc program in Data Science and Artificial Intelligence was established in the year 2020-21. Core team of experienced faculty members and industrial experts has been constantly working in building a competent curriculum as per the industry needs and implementing it. Availability of state-of-the-art laboratories, learning resources enrich the overall experience of learners. The mentors are constantly in touch with the students throughout their journey of two years to discuss their opportunities, options and work in various fields of projects, seminars and research. RJ placement cell facilitates the students with ample opportunities to work on live projects, internship and final placement. Students are also trained and mentored before their placements. Number of Multinational and start up organizations are part of the learning and placement process.

The pre-existing departments – Computer Science, Information Technology and Statistics always extend their support towards RJ DSAI program.

Our Curriculum Your Strength

A team of in-house and guest faculty members, along with industrial expert and alumni works round the year to work on the development and upgrading the curriculum of MSc DSAI program. The curriculum is designed in line with international standards of a

professional program. Choice based grading system facilitates the students to select from niche skill areas as their elective subjects.

Focus areas of learning include Data Science, Artificial Intelligence, Data Visualization, Machine Learning, Image Processing, Soft Computing, Deep Learning, Natural Language Processing, Cloud Computing etc.

In each semester, a student works on at least one seminar, minor or major project. The project-based learning makes a learner very strong in their knowledge and skills. Expert guidance from our alumni and industry turns out to be to great advantage for the fresh post graduates.

Furthermore, continuous assessment is an integral part of the evaluation, which will facilitate systematic and thorough learning towards a better understanding of the subject to the students.

Program Outcomes

Students of all Post graduate degree program on completion of the program will be able to,

Convey the concept clearly

Students would have clarity and complete domain knowledge. Shall be able to analyze solve, innovate and convey the concept clearly by utilizing effective communication skills

Social Interaction

Respect each other and should be able to resolve conflicts and help in reaching amicable solution. They should be able to work in diverse teams. They should be able to distinguish when and what is socially acceptable. Students would perform functions that demand higher competence in national/international organizations with positive spirit and cooperate with peer. Provide leadership and be mentors.

Responsible citizen

Contribute to Nation development through social service. Being empathetic and sympathetic to fellow beings.

Honesty and Integrity, Ethics

Recognize different values and systems and respect them. In decision making moral values should be given prime importance. Student should be aware of ethical issues and regulatory considerations while addressing society needs for growth with honesty.

Environmental and Sustainability

Environmental issues would be considered and problem solving with sustainable development would be chosen.

Life Long learning and Global thinking

Enjoy learning in every situation and should have skills for adapting in any part of the world and contribute to nation building globally.

Program Specific Outcomes

Data Science and Artificial Intelligence fields bought fourth industrial revolution. The department of Computer Science and Information Technology has jointly introduced the Master Program in Data Science and Artificial Intelligence (MSc DSAI) in 2020-21 to cater the needs of IT Industry. This program offers two custom tracks, Data Science and Artificial Intelligence to fresh graduates and the early career professional looking to build their career in Data Science and Artificial Intelligence.

The program is designed to benefit all students to study various aspects of data science and artificial intelligence including its applications. After successful completion of this course the students can take up the role of data engineer, data analyst, AI Engineer, data scientist at various organizations. They can also take up freelance projects or can be part of startup organization. Apart from this they can also do teaching at different levels, research work in research institutes and or industry, doctoral work, scientific writing on relevant topics.

The curriculum for the M.Sc. DSAI program is designed to cater to the requirement of Choice Based Credit System following the University Grants Commission (UGC) guidelines. The major areas that are focused throughout the program are Data Science, Artificial Intelligence, Cloud Computing, Big Data Analytics, Visualization, Virtual & Augmented Reality, Machine Learning and Deep Learning.

The program includes Core courses, Discipline oriented Elective Courses from Data Science and Artificial Intelligence fields, along with the Career Advancement Courses. Students would be encouraged to take up live projects and earn credits for the same in all semesters. All the courses in the program are carefully designed to equip the students for professional certifications and competitive exams like aptitudes, NET, SET etc. and to write research proposals for grants.

PSO1	Understanding the Data Operations and implementation using the various programming languages and the packages.
PSO2	To develop in depth understanding of the key technologies in Data Science and Artificial Intelligence.
PSO3	To enable student to excel in the field of Data Analytics, Data Mining, Machine Learning, Visualization Techniques, Predictive Analysis and Statistical modelling, Machine Learning, Natural Language Processing and Applications of Artificial Intelligence.
PSO4	To gain practical, hands-on experience with programming languages, data analysis tools, creating and implementing applications.

Table of mapping course learning outcomes to program learning outcomes

	Course Code	Core Competency	Critical Thinking	Analytical	Research Skills	Problem Solving	Team Work
MSc DSAI Semester I	RJSPGDSAI101	√	√	√	√	√	√
	RJSPGDSAI102	√	√	√	√	√	√
	RJSPGDSAI103	√	√	√	√	√	√
	RJSPGDSAI1L1	√	√	√	√	√	√
	RJSPGDSAI1L2	√	√	√	√	√	√
	RJSPGDSAI1P1A	√	√	√	√	√	√
	RJSPGDSAI1P1B	√	√	√	√	√	√
	RJSPGDSAI1C1	√	√	√	√	√	√
MSc DSAI Semester II	RJSPGDSAI201	√	√	√	√	√	√
	RJSPGDSAI202	√	√	√	√	√	√
	RJSPGDSAI203	√	√	√	√	√	√
	RJSPGDSAI2L3	√	√	√	√	√	√
	RJSPGDSAI2L4	√	√	√	√	√	√
	RJSPGDSAI2P2A	√	√	√	√	√	√
	RJSPGDSAI2P2B	√	√	√	√	√	√
	RJSPGDSAI2C2	√	√	√	√	√	√

Teaching Learning Process

The teaching learning process in the learning outcomes-based curriculum framework in the subject of Information Technology is designed to help students to learn the subject in greater details, analyze and apply as and when required. The course offers the requisite skills for a professions and jobs in Information Technology. All courses have practical and hands-on sessions an integral part which promotes the learner to acquire the requisite skills for employment by experiential learning. Teaching also involves guest lectures by experts drawn from research institutes of repute, industries, and entrepreneurs.

An interesting combination of teaching learning processes is adopted in which the teacher and learners are actively involved.

Some of the salient teaching learning processes are

- Class lectures
- Hands-on sessions
- Presentations
- Group Discussion, workshops
- Peer teaching and learning
- Flipped classroom, project-based learning, quiz, seminars, exhibitions, posters
- Practical's experimental design planning, analysis, interpretation, application of knowledge gained
- Major Project
- Technology enabled self-learning

The effective teaching strategies would address the requirements of leaner to learn at their own pace. Self-learning is encouraged at postgraduate level emphasis is on acquiring higher order skills. The entire program is also designed to foster the technical skills as per the industry requirement. The teaching learning processes adopted would aim at participatory pedagogy.