

# ACADEMIC YEAR 2019-20

# Feedback from Employees: Analysis Report

Date: 08.10.20

# I. Institution website

- a) Feedback has been received from faculty members in the following parameters:
- 1. Administration is teacher friendly
- 2. Environment in the Institution is conducive to teaching and research
- 3. Adequate opportunities and support to faculty members for upgrading their skills and qualifications
- 4. Availability of prescribed books in Central library
- 5. Cleanliness in classrooms and campus
- 6. Examination and Evaluation system
- 7. Students discipline inside the classroom and campus
- 8. Canteen facilities
- 9. Transport facilities
- 10. Medical facility
- 11. Laboratory facilities
- 12. General schemes of the Institution for the benefit of faculty members (EPF / Leave benefits / Gratuity / Insurance)
- 13. Financial support to attend FDP/ Workshop / Conferences
- 14. Academic work load allotment and responsibilities
- 15. Grievance Redressal mechanism
- 16. Rate attainment of programme (in the course handled)
- 17. Rate attainment of course outcomes (in the course handled)





No. of Respondents	: 125
Cumulative Average	: 8.5
Indication	: V. Good

# Suggestions received pertaining to Curriculum and Syllabus:

SI. No.	Nature	Suggestions
1.	Suggestive	More Arabic Language related courses may be introduced and Arabic Department is need of the time
2.	Appreciative	Curriculum is very good. The recent revision enhanced it. Further career aspect may be considered.
		Curriculum is based on the guidelines of AICTE.



SI. No.	Nature	Suggestions
3.	Suggestive	It is proposed to introduce 4 to 6 courses under elective "Waste Management & Social Entrepreneurship"
4.	Appreciative	The curriculum which is offered is up to date and to meet the industry needs. More over there is a flexible system to update the curriculum through BoS. So, the students will be get benefited with latest technology.
5.	Suggestive	<ul> <li>The following new courses may be introduced</li> <li>1. An Introduction to Practical Deep Learning</li> <li>2. Statistics and Machine Learning</li> <li>3. Neural Networks and Deep Learning</li> <li>4. Applied Data Science with Python</li> <li>5. Machine Learning with Python</li> </ul>
6.	Suggestive	A new course like aptitude & soft skills that is helpful for final year placement can be added in 3rd year as regular course as it will be very helpful for students and more no. of students can also get easily placed.
7.	Appreciative	Well designed industry oriented curriculum and courses.
8.	Suggestive	Yes, a new course, 'Behavioral Psychology' to be introduced and it is a must for the present student culture.
9.	Appreciative	Courses in the curriculum are well knitted together and the only requirement is periodic update of the syllabus.
10.	Suggestive	Public Administration and Political science can be introduced it is very useful for competitive examination. Many coaching institute has offering as main subject.
11.	Appreciative	Curriculum is up to the mark



SI. No.	Nature	Suggestions
12.	Suggestive	I suggest to introduce 'Masters in Social Work' and Degree Programme in 'Social Work'.
13.	Appreciative	As of now curriculum is up to the mark.
14.	Suggestive	The New courses can be included with practical session like Block Chain Technology, Machine Learning and AI.
15.	Suggestive	Automation and testing laboratory to be updated.
16.	Appreciative	good

# Table: Shows the summary of Appreciations & Suggestions

SI.	Appreciations	Suggestions
No.		
1	The curriculum which is offered is up	More Arabic Language related
	to date and to meet the industry	courses may be introduced and Arabic
	needs. More over there is a flexible	Department is need of the time
	system to update the curriculum	
	through BoS. So, the students will be	
	get benefited with latest technology.	
2	Courses in the curriculum are well	Curriculum is based on the guidelines
	knitted together and the only	of AICTE.
	requirement is periodic update of the	
	syllabus.	
		It is proposed to introduce 4 to 6
3	As of now curriculum is up to the	courses under elective "Waste
5	mark.	Management & Social
		Entrepreneurship"
		Yes, a new course, Behavioral
4	Good	Psychology tube introduced and it is a
		must for the present student culture.
5	Public Administration and Political	A new course like aptitude & soft skills
5	science can be introduced it is very	that is helpful for final year placement
L	A/C	



SI. No.	Appreciations	Suggestions
	useful for competitive examination.	can be added in 3rd year as regular
	Many coaching institute has offering	course as it will be very helpful for
	as main subject.	students and more no. of students can
		also get easily placed
6	Well designed industry oriented	Need some changes. For that we are
0	curriculum and courses.	working
		The following new courses may be
		introduced
		1. An Introduction to Practical Deep
	Curriculum is very good. The recent	Learning
7	revision enhanced it. Further career	2. Statistics and Machine Learning
	aspect may be considered.	3. Neural Networks and Deep
		Learning
		4. Applied Data Science with Python
		5. Machine Learning with Python
		I suggest to introduce Masters in
		Social Work and Degree Programme
8		in Social Work. Since, we are a
		charitable trust it would be
		appropriate.
		The New courses can be included
9		with practical session like Block Chain
9		Technology, Machine Learning and
		AI.
10		Automation and testing laboratory to
10		be updated and Introduce.

# Annexure A: Sample Employees online feedback forms

**II. Feedback received from faculty members** through department level faculty meetings which are based on students and own perspective about the courses, curriculum, syllabus revision etc.



These feedbacks were further deliberated in the department level Board of Studies meeting held during January 2020 (I Phase) & June 2020 (II Phase) and accordingly recommended to academic council by the concerned BoS.

Annexure B: Minutes of the department level meeting of Computer Science Department held on 04.06.2020 & minutes of 15th meeting of BoS of Department of Electronics and Instrumentation Engineering held on 05.02.20 are attached as evidence for intense participation of faculty members in the curriculum & syllabus revision.

The salient points arrived for further course of action are:

- Programme Specific Outcomes of the minor degree programme offered to B.Tech. can be explored
- Starting of new programmes based on industry need
- Facilitating more MOOC courses / compulsory industry internship / enrolment in value added courses etc. in the M.Tech. Regulations
- Revision in curriculum & syllabi considering the industry trend and emerging areas.
- Introduction of new courses in the curriculum of minor degree to increase employability.

Dean, Academic Affairs

DEAN (ACADEMIC AFFAIRS) B.S. Abdur Rahman Crescent Institute of Science & Technology Vandalur, Chennai - 600 048, India

31/12/2020	Employees (Tea	aching) Feedback   Crescent Education
	B.S. Abdur Rahman <b>CESCENT</b> e of Science & Technology	Annexure A: Online Employee feedback
	ned to be University u/s 3 of the UGC Act, 1956	Certified Institution
Admissions Research		
	UG ADMISSIONS PG ADMISSIONS INTERNATION	NAL ADMISSIONS NRI ADMISSIONS ENQUIRE NOW
	Online Exam	nination - Login
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CAREERS FEEDBACK LI	MS ESTATE	
		*Anti-Ragging Cell Control Rooms / Helplines: 91(44) 2275920
	Employees (Teaching) Feedback	
	Name of the Employee*	
	PANDIYAVATHI T	
	Employee ID:*	Email ID*
	2019120	pandiyavathi@crescent.education
	Department*	Designation*
	computer applications	Assistant Professor
	Administration is teacher friendly Very Good	
	Environment in the Institution is con	ducive to teaching and research
	Very Good	~
	Adequate opportunities and suppor their skills and qualifications	t to faculty members for upgrading
	Availability of prescribed books in Central library	Cleanliness in classrooms and campus
	Excellent ~	Very Good 🗸
		Students discipline inside the
	Examination & Evaluation system	classroom & campus
	Good 🗸	Good
	Canteen facilities	Transport facilities
	Very Good	Good
	Medical facility	Laboratory facilities
	Very Good	Satisfactory
	General schemes of the Institution for (EPF/Leave benefits/Gratuity/Insuration)	
	Very Good	
	,	

Financial support to attend FDP / Workshop / Conferences	Academic work load allotment and responsibilities
Good	Good
Grievance Redressal mechanism Satisfactory	Rate attainment of programme (in the course handled) Very Good
Rate attainment of course outcomes (in the course handled) Very Good	
Your opinion about Curriculum (courses in the programme) and suggestions for new courses to be	
introduced	Any other suggestions
Revision of the syllabus in the pace of low level of understanding to high level can be made so as to get a linear curve of understanding ability among students. Too old. Too new concepts can be	
UXAK	

#### SITEMAP

### **ADMISSIONS**

Undergraduate Postgraduate International admissions NRI Admissions Ph.D Admissions

### RESEARCH

UXAK

Submit

Programmes Academic Research Sponsored Projects & Consultancy

### INSTITUTE

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# LEGAL

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B.S. Abdur Rahman Crescent Institute of Science & Technology	Annexure A: Online Employee feedback
Deemed to be University u/s 3 of the UGC Act, 1956 An ISO 9001:2015	Certified Institution
Admissions Research Departments Institute Connect Why Cresce	nt?D
UG ADMISSIONS PG ADMISSIONS INTERNATIO	NAL ADMISSIONS NRI ADMISSIONS ENQUIRE NOW
General Enquiry +91 44 2275 1347 +91 44 2275 9200 Admission Help Desk +91 95432 77888 S+91 94990 01725	nination - Login Idents Login   Staff Login
	NDATORY DISCLOSURE   ISO   NAD   DSIR
ABOUT US ADMINISTRATION ACADEMICS ACCREDITATION RESEARCH ESPACE CAREERS FEEDBACK LMS ESTATE dressal of Sexual Harassment of Women Employees and students at Workplace (Helplin Employees (Teaching) Feedback	
Name of the Employee*	
Employee ID:*	Email ID*
201836	hodms@crescent.education
Department* DEPARTMENT OF MANAGEMENT STUDI	Designation* Professor & Head
Administration is teacher friendly	
Excellent	
Environment in the Institution is con Excellent	nducive to teaching and research
Adequate opportunities and support their skills and qualifications	rt to faculty members for upgrading
Select	~
Availability of prescribed books in Central library	Cleanliness in classrooms and campus
Excellent	
Examination & Evaluation system	Students discipline inside the classroom & campus Very Good
Canteen facilities	Transport facilities
Excellent	
Medical facility	Laboratory facilities
General schemes of the Institution (EPF/Leave benefits/Gratuity/Insur Very Good	-

Einancial support to attand EDR /	Feaching) Feedback   Crescent Education Academic work load allotme	ont and
Financial support to attend FDP / Workshop / Conferences	responsibilities	ent anu
Excellent	✓ Excellent	~
Grievance Redressal mechanism	Rate attainment of program the course handled)	me (in
Very Good	✓ Excellent	~
Rate attainment of course		
outcomes (in the course handled)		
Excellent	~	
Your opinion about Curriculum		
(courses in the programme) and		
suggestions for new courses to be		
introduced	Any other suggestions	
"Curriculum is based on the guidelines of AICTE.	nil	
It is proposed to introduce 4 to 6 courses under elective ""Waste Management & Social Entrepreneurship"""		
BHS3		

#### SITEMAP

# **ADMISSIONS**

Undergraduate Postgraduate International admissions NRI Admissions Ph.D Admissions

### RESEARCH

# Programmes Academic Research Sponsored Projects & Consultancy

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Annexure B: Minutes of Department Level of Meeting of CSE Department



# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MINUTES OF MEETING

The following are the minutes of the meeting held by the BoS co-ordinator with the faculty members of the department.

Date: June 04, 2020 - 10 AM :12 PM

**Mode** : Google Meet App

Convened By: Dr. W. Aisha Banu, Prof & BoS Co-ordinator

Dr. Sharon Priya, AP (Sr.G)

Mrs. R. Akila, AP (Sr.G)

Mrs. J. Brindha Merin (Sr.G)

The following members were present for the meeting:

S.No.	Faculty Name	Designation
1.	Dr. E. Syed Mohamed	Professor & HOD
2.	Dr. Sharmila Sankar	Professor
3.	Dr. W. Aisha Banu	Professor
4.	Dr . S. Revathi	Professor
5.	Dr. X. Arputha Rathina	Associate Prof
6.	Dr. N. Sabiyath Fatima	Associate Prof
7.	Dr. L. Arun Raj	Associate Prof
8.	Mrs. S.P. Valli	Asst.Prof.(SI.Gr)
9.	Mrs. C. Vijayalakshmi	Asst.Prof.(Sr.Gr)
10.	Mrs. R. Akila	Asst.Prof.(Sr.Gr)
11.	Dr. Sharon Priya	Asst.Prof.(Sr.Gr)
12.	Mr. S. Syed Abdul Syed	Asst.Prof.(Sr.Gr)
13.	Mrs. C. Hema	Asst.Prof.(Sr.Gr)
14.	Mrs. D. Madhina Banu	Asst.Prof.(Sr.Gr)
15.	Mrs. J. Brindha Merin	Asst.Prof.(Sr.Gr)
16.	Mrs. S. Subhashini	Asst.Prof
17.	Mr. C. Ramachandran	Asst.Prof
18.	Mr. Manoj Kumar	Asst.Prof
19.	Mr. V.Balaji	Asst Prof
20.	Mr. Ashfauk Ahamed	Asst Prof

# **Minor Degree coordinators**

S.No.	Faculty Name	Minor Degree
1.	Dr. Sindhu Ravindran, AP/MCA	Artificial Intelligence and Machine Learning
2.	Dr. Faraz Hasan, AP/MCA	Block Chain
3.	Mr. N. Rajendran, AP(Sr. G)/IT	Cyber Secutiy
4.	Mrs. R. Akila, AP(Sr. G)/CSE	Data Science
5.	Dr. L. Arun Raj, Assoc. Prof.	Virtual Augmented Reality
6.	Dr. Kabeer M, Assoc. Prof.	Sensor Technology

# **Minutes of the Proceedings**

Curriculum and Syllabi for suggestion and deliberations for Minor Degree

# **Block Chain**

- 1. Dr. Faraz Hasan, Assistant Professor (MCA) deliberated the curriculum and the outcome of the course.
- 2. Following are the suggestions given by the faculty:
  - Instead of Block chain Introduction, include Fundamentals of Network and Cryptography. Move it to next semester.
  - Few Data structure concepts needed for block chain so add basic concepts (tree) in module 1.
  - Advised to refer blockchain-council.org to frame the syllabus such that it helps the students to provide end to end information for development of block chain.
  - Corda term to be removed from course title. Rename it as Block chain application development using IDE's. Student can use any IDe whichever he/she is comfortable.
  - Distributed computing and Ladger Tech should come before Block chain application development as it has all the tools.
  - $\circ~$  6 objectives and outcomes for all courses.
  - Instead of general cryptography, specify cryptography wth regard to block chain in the modules content.
  - $\circ$  The syllabus to be changed based on the suggestions.

# Artificial Intelligence and Machine Learning

- 1. Dr. Sindhu Ravindran, Assistant Professor (MCA) deliberated the curriculum and the outcome of the course.
- 2. Following are the suggestions given by the faculty
  - Robotics can be as Process Automation.
  - Introduction to AI and ML syllabus is heavy, split into two separate subjects.
    - Artificial Intelligence
    - Machine Learning
  - Neural Networks can be combined with AI or ML.
- 3. As most of these courses are offered in regular B.Tech (AI & DS), the team is asked to work with Dr. N.Sabiyath Fathima, as the same regular courses can be used for minor degree instead of the same course being repeated in two places.

# Data Science

- 1. Mrs. R. Akila, Assistant Professor (Sr.G)/CSE, deliberated the curriculum and the outcome of the course.
- 2. Following are the suggestions given by the faculty
  - For Data mining course, in module 1 few concepts of DBMS to be included.
  - Machine Learning to work with Dr. N.Sabiyath Fathima and decide credits.

# Virtual Augmented Reality

- 1. Dr. L. Arun Raj, Associate Professor, CSE, deliberated the curriculum and the outcome of the course.
- 2. Following are the suggestions given by the faculty:
  - $\circ$  Availability of the open source tools to be discussed.
  - Feasibility of the lab setup to be checked and then the curriculum to be framed.
  - Design thinking can be considered as one subject.

# **Sensor Technology**

- 1. Dr. Kabeer M, Associate Professor, IT, deliberated the curriculum and the outcome of the course.
- 2. Following are the suggestions given by the faculty:
  - Experiments to be designed such that sensor data analysis is there.

Cyber Security – work with major degree and present on 8/6/2020

- In general all the major and minor degrees have Python programming as one course. So it was decided to have it as a common course.
- 4. BoS coordinator thanked the faculty and requested the teams to work on the suggestions.
- HOD concluded the meeting.



E. Sted rocham

Dr.E.SYED MOHAMED, HOD/CSE

Annexure B: 14th Meeting of Board of Studies Meeting of EIE Department



#### SCHOOL OF ELECTRICAL AND COMMUNICATION SCIENCES

#### DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

### Minutes of the Fourteenth Meeting of Board of Studies

The fourteenth meeting of the Board of Studies for the Department of Electronics and Instrumentation Engineering was held at 10 a.m. on 05.02.2020 in the Seminar Hall of the Department. The following members were present.

#### Internal Members

- 1. Dr. P.K.Jawahar, Prof & & Chairman (BoS)
- 2. Dr. D.Najumnissa Jamal, Prof & Dean (SECS)
- 3. Mr.S.Shahul Hamid, Visiting Prof
- 4. Ms.G. Anitha, Asst Prof (Sel.G)
- 5. Ms. M.S.Murshitha Shajahan, Asst Prof (SG)
- 6. Ms.P.R.Hemavathy, Asst Prof (SG)
- 7. Dr.H.Kareemullah, AP
- 8. Mr.Rajkumar Sakthibalan, Ostara Research
- 9. Mr.A.Venkatesan, Head, NPI, Eaton MTL

Dr. P.K.Jawahar, Head of the Department and Chairman BoS welcomed the members for the Board of studies and explained the agenda of the meeting.

# Item 14.1 To consider and approve the revision of the syllabi contents of certain courses in B.Tech (Electronics and Instrumentation) R2017

HOD presented the elective courses of B.Tech(EIE) to the board members. The external expert members went through the course contents of elective courses and suggested the following changes

 EICX22 Robotics and Automation is revised and modified. This enhancement in this course will be applicable from the academic year 2020-2021 onwards

Enhancement made in the syllabus was approved by Board of Studies

It was resolved to approve the item 14.1 and recommend the same to the Academic Council of the University

 EICX65 Machine Learning is revised and modified. This enhancement in this course will be applicable from the academic year 2020-2021 onwards

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Enhancement made in the syllabus was approved by Board of Studies

It was resolved to approve the item 14.1 and recommend the same to the Academic Council of the University

Item 14.2 To consider and approve the syllabi of General Elective courses

Expert from Eaton MTL Instruments suggested a new General Elective course EMC (Electromagnetic Compatibility) & EMI (Electromagnetic Interference). In order to protect the Instruments / Devices from unintentional generation, propagation and reception of electromagnetic energy which may cause unwanted effects such as electromagnetic interference (EMI) or even physical damage in operational equipment, students should know the importance of EMI and EMC.

Enhancement made in the syllabus was approved by Board of Studies

It was resolved to approve the item 14.2 and recommend the same to the Academic Council of the University

Expert from Eaton MTL Instruments suggested a new **General Elective course Project Management.** Students should know how to initiate a project plan, manage stakeholders relationships, organize their team, and to develop project timeline chart, this elective is proposed.

Enhancement made in the syllabus was approved by Board of Studies

It was resolved to approve the item 14.2 and recommend the same to the Academic Council of the University

#### Item 14.3 To consider and approve the syllabi of One credit course

A value added course on "Data Historian and Analysis" was proposed in the meeting as one credit course. The course will be introduced from the academic year 2020-2021.

It was resolved to approve the item 14.3 and recommend the same to the Academic Council of the University

#### Item 14.4 To consider and approve the Change in Course code for the course Thermodynamics and Fluid Mechanics

Based on the feedback from the students and teachers, the lab integrated course EIC2211 Thermodynamics and Fluid Mechanics is converted in to regular theory course of 3 credit and the course code is EIC2216.

It was resolved to approve the item 14.4 and recommend the same to the Academic Council of the University.

Item 14.5 To consider and approve the points discussed in the SLAC meeting.

The School Level Advisory Committee Meeting for the Department of Electronics and Instrumentation Engineering was held at 10.00 AM on 04.01.2020, following points were discussed.

- HOD/EIE asked whether EIC 2211 Thermodynamics and Fluid Mechanics is really wanted for EIE students. Dr. K. Kamalanand told that it is an important course and syllabus can be simplified.
- Regarding EIC3102 Microprocessor and Microcontroller course, Dr. K. Kamalanand told very little importance can be given to 8085. And he told that no separate course for Labview is needed. It can be studied in the course virtual Instrumentation
- He suggested that, instead of thermal power plant instrumentation (EICX62) we can have Power Plant Instrumentation or in the name of Renewable & Nonrenewable power plant Instrumentation.
- Mr.P.Lenin suggested that the course Plant Engineering is an essential course wanted by industries. And he appreciated the syllabus framed by the department.

After detailed discussion, it was resolved to approve the item 14.5 and recommended the same to the Academic Council of the University.

PROFESSO ertment of Electronics & Instrumentation Enge B.S. Abdur Rahma esc nstitute of Science & Technology Vandalur, Chennal ... 048.



### **ANNEXURE I**

#### SCHOOL OF ELECTRICAL AND COMMUNICATION SCIENCES DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

EICX22

### ROBOTICS AND AUTOMATION L T

(Pre Requisite: Mathematics, Control 3 0 0 3 Systems)

#### **OBJECTIVES:**

- To study the various parts of robots and fields of robotics.
- To study the various kinematics and inverse kinematics of robots.
- To study the Euler, Lagrangian formulation of Robot dynamics.
- To study the trajectory planning for robot.
- To study the control of robots for some specific applications.

# MODULE I BASIC CONCEPTS

Definition and history of robotics – degrees of freedom – Asimov''s laws of robotics Robot Anatomy – Co-ordinate Systems, Work Envelope, types and classification – Specifications – Pitch, Yaw, Roll, Joint Notations, Speed of Motion, Pay Load – Robot Parts and Their Functions – Need for Robots – Various fields of Robotics

### MODULE II POWER SOURCES AND SENSORS

Hydraulic, pneumatic and electric drives – determination of HP of motor and gearing ratio – variable speed arrangements – path determination – micro machines in robotics – machine vision – ranging – laser – acoustic – magnetic, fiber optic and tactile sensors

#### MODULE III MANIPULATORS, ACTUATORS AND GRIPPERS

Construction of manipulators – manipulator dynamics and force control – electronic and pneumatic manipulator control circuits – end effectors – Various types of grippers – design considerations - Bio actuators.

#### MODULE IV KINEMATICS AND PATH PLANNING

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Solution of inverse kinematics problem – multiple solution jacobian work envelop – hill Climbing Techniques – robot programming languages - Biomimicry.

# MODULE V CASE STUDIES

Robot Maintenance and Safety - nano robots and mobile robots - Mutiple robots - machine interface - robots in manufacturing and non- manufacturing applications - robot cell design - selection of robot.

### L – 45; Total Hours –45

9

### **TEXT BOOKS:**

- Mikell P. Weiss G.M., Nagel R.N., Odraj N.G., "Industrial Robotics", Mc Graw-Hill Singapore, 1996.
- Ghosh, Control in Robotics and Automation: Sensor Based Integration, Allied Publishers, Chennai, 1998.

#### **REFERENCES:**

- Deb. S.R., "Robotics Technology and flexible Automation", John Wiley, USA 1992.
- Klafter R.D., Chimielewski T.A., Negin M., "Robotic Engineering An integrated approach", Prentice Hall of India, New Delhi, 1994.
- Mc Kerrow P.J. "Introduction to Robotics", Addison Wesley, USA, 1991.
- Issac Asimov "Robot", Ballantine Books, New York, 1986.
- Barry Leatham Jones, "Elements of industrial Robotics" PITMAN Publishing, 1987.
- Mikell P.Groover, Mitchell Weiss, Roger N.Nagel Nicholas G.Odrey, "Industrial Robotics Technology, Programming and Applications ", McGraw Hill Book Company 1986.
- Fu K.S. Gonzaleaz R.C. and Lee C.S.G., "Robotics Control Sensing, Vision and Intelligence" McGraw Hill International Editions, 1987.

#### OUTCOMES:

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Upon completion of the course, the student should be able to:

- Choose proper methods for different applications
- Select Power sources and sensors for various applications
- Select actuators and manipulators for various applications
- Analyze and apply kinematics for design of Robots
- Design Manipulators for various robotic applications

•	EICX65	MACHINE LEARNING	L	Т	Ρ	с
			3	0	0	3

### **OBJECTIVES:**

- To understand the need for machine learning for various problem solving
- To study the various supervised, semi-supervised and unsupervised learning algorithms in machine learning
- To understand the latest trends in machine learning
- To design appropriate machine learning algorithms for problem solving

### MODULE I UNIT I INTRODUCTION

Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.

#### MODULE II NEURAL NETWORKS AND GENETIC ALGORITHMS

Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning.

#### MODULE III BAYESIAN AND COMPUTATIONAL LEARNING

Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

# MODULE IV INSTANT BASED LEARNING

K- Nearest Neighbor Learning – Locally weighted Regression – Radial Basis

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Functions – HMM (Hidden Markov Model Case Based Learning) - GMM (Gaussian Mixture Model).

### MODULE V ADVANCED LEARNING

Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning

#### L - 45; Total Hours - 45

#### TEXT BOOK:

1. Tom M. Mitchell, "Machine Learning", McGraw-Hill Education (India) Private Limited, 2013.

#### **REFERENCES:**

- 1. Ethem Alpaydin," Introduction to Machine Learning (Adaptive Computation and Machine Learning)", The MIT Press 2004.
- 2. Stephen Marsland, "Machine Learning: An Algorithmic Perspective", CRC Press, 2009.

#### OUTCOMES:

#### At the end of the course, the students will be able to

- Differentiate between supervised, unsupervised, semi-supervised machine learning approaches
- Discuss the decision tree algorithm and overcome the problem of overfitting
- Discuss and apply the back propagation algorithm and genetic algorithms to various problems
- Apply the Bayesian concepts to machine learning
- Analyse and suggest appropriate machine learning approaches for various types of problems

9