CDC DEPARTMENT

Curriculum Development Center

Outline

- About Department
- Vission and Misssion
- Department Faculty
- Long Term and Short Term Programs
- Curriculum Development
- Instructional Material Development
- Research & Development
- Extension Services & Consultancy
- Major Initiatives & Achievements
- Faculty International Exposure
- Future Plan & Roadmap

ABOUT DEPARTMENT

ABOUT DEPARTMENT

- Established in 1971 by Govt. of India, Ministry of Human Resource Development
- To keep the curricula offered by the polytechnic in tune with the requirements of World of Work.
- Rendering services to the Directorates/Boards of Technical Education/Universities in the states of Northern Region

DEPARTMENT VISION & MISSION

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VISION & MISSION

To be a world class centre for developing globally competitive, innovative and transformative curricula for technical professionals.

M1 Developing State of the Art curricula in cognizance with global requirements.

M2 Offering continuing education programmes in the area of curriculum development.

M3 Undertaking action research for improving curriculum effectiveness in emerging areas

M4 Rendering consultancy to various organizations for establishing new institutions and selection of programmes

M5 Developing curricula related supportive material for effective implementation of technical programmes.

DEPARTMENT FACULTY

DEPARTMENT FACULTY

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Name	Affiliation	Experience	Research Areas	Vidwan link
Dr. Rajesh Mehra	Professor	25 years	ADSP, VLSI, Renewable Energy, Innovative Curriculum Design, PLC & SCADA	https://vidwan.inflibnet.ac.in/profile/171088
Dr. A.B. Gupta	Professor	34 years	Curriculum Development, Manufacturing Technology	
Dr. S.K. Gupta	Associate Professor	32 years	Curriculum Development, Civil Engineering	https://vidwan.inflibnet.ac.in/profile/171207
Dr. M. Sood	Associate Professor	20 years	Biomedical, Signal & Image Processing, Automation	https://vidwan.inflibnet.ac.in/profile/170888

DEPARTMENT OBJECTIVES

DEPARTMENT OBJECTIVES

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- Undertaking basic research for developing new models of curriculum design, implementation and evaluation
- Identifying changes in technical manpower job profile for selecting new programme offerings and modifying the existing programmes
- Designing and reviewing of curricula for technical programmes at different levels in emerging areas of technology/vocations and making these relevant to the needs of industry and other sectors of employment

DEPARTMENT OBJECTIVES

- Offering education and training programmes for polytechnic and engineering college teachers in specific areas of curriculum development, leading to effective implementation of curricula
- Undertaking action research for improving curriculum effectiveness in terms of teaching-learning process, student's assessment, utilization of institutional facilities and networking with employers/other organizations
- Rendering consultancy to various organizations for establishing new institutions and selection of programmes

LONG TERM & SHORT TERM PROGRAMS

LONG TERM PROGRAMMES

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Faculty is actively involved in providing support to Engineering departments

- **ME classes**
- **ME Thesis and PhD Guidance**

SHORT TERM PROGRAMMES

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- Practical Skills in Technical Education
- Research Oriented Project Work
- Lab Practices in Free and Open Source Softwares
- Skill Development for Industry 4.0
- Curriculum Development Process
- Effective Curriculum Implementation
- Planning, Execution and Evaluation of Project Work

SHORT TERM PROGRAMMES

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- NSQF Aligned Curriculum- Design and Implementation
- Accreditation Criteria and Process of Outcome-Based Education
- Choice Based Credit System
- Education 4.0 aligned with Industry 4.0
- Curriculum design for developing job related competencies

SHORT TERM PROGRAMMES

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- Mentoring and Coaching
- Developing Academic and Administrative Leadership
- Developing Practical Skills

STCs/WORKSHOPs

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Session	STC (Contact Mode)	STC (ICT Mode)	Workshops
2020-21	-	19	52
2019-20	27	8	5
2018-19	23	7	33
2017-18	7	3	38
2016-17	5	3	32
2015-16	13	8	15

CURRICULUM DEVELOPMENT

MAIN GOAL

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- NSQF compliant Curriculum Design to provide:
  - Outcome Based Education
  - Enhanced wage and self employability

PDCA for Curriculum Design

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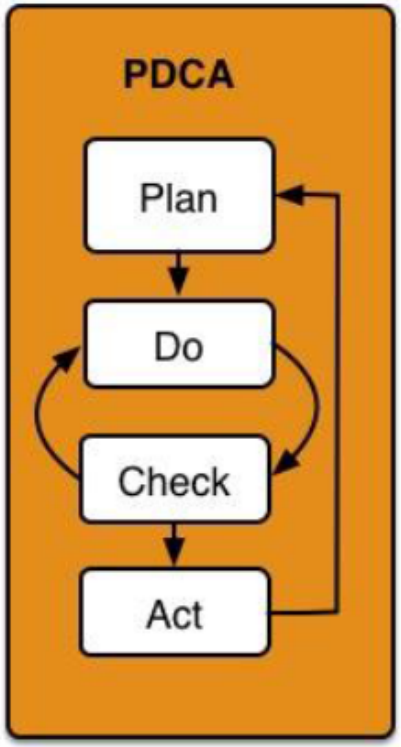

Plan

Identify a problem or a goal and make a plan.

Do

Implement the plan.

Check

Check results to see if the plan worked.

Act

Decide what to do next.

PDCA for Curriculum Design

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Step1:

Plan

- Defining the problem or issue that requires redress
- Defining the ideal or desired state
- Data collection to determine the problem in terms of deviance from the ideal state
- Ascertaining the root cause for the problem or issue
- Evaluating the various possible interventions to solve the problem and their possible outcomes
- Selecting the best possible intervention

PDCA for Curriculum Design

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Step2:

Do

- Implementation of the selected solution to reduce the deviation or solve the issue
- Initially on a small scale to check its effectiveness.
- Successful implementation results in across-the-board implementation.

PDCA for Curriculum Design

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Step 3:

Check

- Comparing the actual performance against such set standards.
- Use of statistical tools to understanding the nature of variation in the process output in terms of **what worked, what did not work, and the lessons learned** from the experience.
- Check the results, verify, and come to conclusion.

PDCA for Curriculum Design

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Step 4:

Act

- Standardize the successful solution and adopting the same for across-the-board implementation process improvement
- Revised approach towards PDCA for Quality Management

Curriculum Example - Plan

1. Diagnosis of needs which involves conducting market surveys for determining employment opportunities.
2. Technology development at work places and competency profile of technical manpower.
3. Determination of the strength and weaknesses of the system of technical education.
4. Decision on curriculum objectives.

Curriculum Example - Plan

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5. Curriculum areas or subjects are identified.
6. Detailed contents are worked out to Match the competency profile.
7. Working out time requirements for Imparting desired Knowledge.
8. Selection of appropriate methods & media for various curriculum areas or subjects are identified

Curriculum Example - Do

1. **Utilization of required resources to provide appropriate learning experience to students for developing desired competencies.**
2. **Networking with industry and other organizations for Sharing resources for effective implementation.**

Curriculum Example - Check

1. Corrective measures to improve teaching learning process by use of effective

a. **Media**

b. **Time Management**

c. **Industry Involvement**

d. **Resource Utilization**

Curriculum Example - Act

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1. Revise the curricula as per:
   a. Industry need
   b. Current Research Areas
2. Delete the outdated contents
3. Include effective media for content delivery

Curriculum Example - Act

4. **Manage the time efficiently to cover the contents in specified time.**
5. **Utilize resources of industry and organizations for effective content delivery.**

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HARYANA

Haryana State Technical Education Board	
1	Curriculum Development Programme in Electronics & Communication Engg. – 2018
2	Curriculum Development Programme in Mechanical Engg. – 2018
3	Curriculum Development Programme in Computer Engg. – 2018
4	Curriculum Development Programme in Electrical Engg. – 2018

HARYANA

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5	Curriculum Development Programme in Automobile Engg. – 2018
6	Curriculum Development Programme in Civil Engg. -2018
7	Curriculum design for diploma programme in 'Aircraft Maintenance Engineering'
8	Curriculum Revision of certificate course in 'Electrical Installation and Maintenance Works' for Skipper Electrical India Ltd. Gurgaon = One (completed) – 2015-16

UTTAR PRADESH

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IRDT, Kanpur, UP	
1	Curriculum Development Programme in Electronic Engg. – Jan 2019
2	Curriculum Development Programme in Computer Science & Engg. – Jan 2019
3	Curriculum Development Programme in Mechanical Engg. _ March 2019
4	Curriculum Development Programme in Electrical Engg. – March 2019

UTTAR PRADESH

CDC DEPARTMENT

5	Curriculum Development Programme in Civil Engg. – Feb 2019
6	Curriculum Development Programme in Chemical Engg.-2018-19
7	Revision of diploma course in 'Information Technology'-2015-16
8	PG diploma in 'Computer Hardware and Networking'-2015-16

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PUNJAB

	Punjab State Board of Technical Education
1	Curriculum Development Programme in Computer Science & Engg. – June 2016
2	Curriculum Development Programme in Automobile Engg. – June 2016
3	Curriculum Development Programme in Mechanical Engg. – Nov. 2017
4	Curriculum Development Programme in Civil Engg. – June 2016
5	Curriculum Development Programme in Electrical Engg. – 2016-17
6	Curriculum Development Programme in Computer Engg. – 2016-17
7	Curriculum Development Programme in Information Technology – 2016-17

PUNJAB

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8	Curriculum Development Programme in Electronics & Comm. Engg. – June 2016
9	Design curriculum on 'Energy Conservation for ITIs and diploma level programme – 2014-15
10	Revised curriculum of 25 diploma programme (First year) – 2014-15
11	Curriculum revision for Part-time diploma in Automobile Engineering-2015-16
12	Curriculum revision for Aerospace Engineering-2015-16
13	Revising certificate course in 'Auto Electrical and Electronics' for MC Polytechnic, Jalandhar-2015-16

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PUNJAB

Maharaja Ranjit Singh, PTU, Bathinda, Punjab	
1	Curriculum Development Programme in Food Processing – March 2018
2	Curriculum Development Programme in Computer Engg. – Feb. 2018
3	Curriculum Development Programme in Refrigeration & Air Conditioning –2018
4	Curriculum Development Programme in Welding Technology – Feb. 2018
5	Curriculum Development Programme in Farm Equipment Technician – Aug. 2018
6	Certificate programmes in Electrician -2016-17
7	Certificate programmes in Tool and Die Maker -2016-17
8	Certificate programmes in Farm Equipment Technician -2016-17

PUNJAB

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9	Certificate programmes in Welder-2016-17
10	Certificate programmes in Plumber-2016-17
11	Certificate programmes in Refrigeration and Air Conditioning Mechanic-2016-17
12	Certificate programmes in Servicing and Maintenance of Electronics-2016-17
13	Certificate programmes in Food Processing-2016-17
14	Certificate programmes in Computer Maintenance and programming Assistant2016-17
15	Certificate programmes in Refrigeration and Air Conditioning Mechanic-2016-17

DELHI

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Board of Technical Education, Delhi	
1	NSQF aligned Diploma programme in 34 discilpilines 2020-22
2	Diploma programme in Mechanical Engineering– 2015-16
3	Diploma programme in Mechanical Engineering (Maintenance) – 2015-16
4	Diploma programme in Automobile Engineering– 2015-16
	Diploma programme in Production Engineering– 2015-16

UTTARANCHAL

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	Uttaranchal State Educational Board
1	Diploma Programme in Automobile Engg. –2009
2	Diploma Programme in Chemical Engg. –2009
3	Diploma Programme in Chemical Technology (rubber & plastic) –2009

HIMACHAL PRADESH

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	Himachal Pradesh State Educational Board
1	Diploma Programme in Civil Engg. –2008
2	Diploma Programme in Computer Engg. –2008
3	Diploma Programme in Automobile Engg. –2008

JAMMU KASHMIR

	Jammu Kashmir State Educational Board
1	Diploma Programme in Computer Engg. –2012
2	Diploma Programme in Medical Electronics –2012
3	Diploma Programme in Architectural Assistantship –2012

OTHERS

CDC DEPARTMENT

Sarthak Centre, Tech. Mahindra Foundation	
1	Skill Development Certificate Programmes on ITeS-BPO-2016-17
2	Skill Development Certificate Programmes on Hospitality-2016-17
3	Skill Development Certificate Programmes on Retail-2016-17
Punjab State Civil Aviation Council, Patiala	
1	Degree level programme in Aeronautical Engineering-2017-18

INSTRUCTIONAL MATERIAL DEVELOPMENT

MATERIAL DEVELOPED

Non Print			
Sr. No.	Type of material	Title	Authors
1.	Video Films in ECE	Introduction to PLCs	Dr. Rajesh Mehra
2.	Video Films in ECE	VLSI Design Flow	Dr. Rajesh Mehra
3.	Video Films in Mechanical Engg.	- Units of Measurement - Standard of Measurement	Dr. A. B. Gupta
4.	Video Films in Mechanical Engg.	- Vernier Caliper, Micrometer Inspection	Dr. A. B. Gupta

MATERIAL DEVELOPED

Print			
Sr. No.	Title	Publisher	Author
1.	PLC & SCADA	Luxmi Publication, New Delhi	Dr. Rajesh Mehra
2.	Manufacturing Technology	New Age International Publishers, New Delhi	Dr. A. B. Gupta
3.	A Practical Handbook for Mechanical Engineers	Galgotia Publisher, New Delhi	Dr. A. B. Gupta
4.	Curriculum Development for polytechnics	TTTI, Chandigarh	CDC Faculty

MOOCS COURSES

CDC DEPARTMENT

- **Developed MooCs on Curriculum implementation and Evaluation**

Swayam portal

https://www.youtube.com/watch?v=oUgMnas-a5g

139K subscribers

RESEARCH & DEVELOPMENT

FACULTY RESEARCH PROFILE

CDC DEPARTMENT

Rajesh Mehra, PhD

FOLLOW

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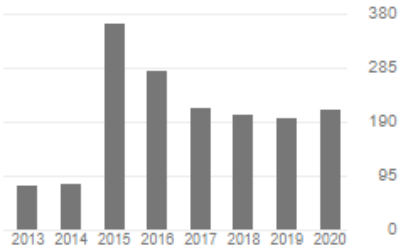
Professor & Head, CDC, NITTTR, Chandigarh, India
Verified email at nitttrchd.ac.in - Homepage

VLSI & Digital Signal Proce... PLC & SCADA Renewable Energy Innovative Curriculum Design

TITLE	CITED BY	YEAR
Power spectrum estimation using Welch method for various window techniques HR Gupta, R Mehra, S Batan International journal of scientific research engineering & technology 2 (6 ...	60	2013
Leakage power reduction in CMOS VLSI circuits P Saini, R Mehra International Journal of Computer Applications 55 (8)	55	2012
Breast cancer histology images classification: Training from scratch or transfer learning? R Mehra ICT Express 4 (4), 247-254	41	2018
Power efficient design of multiplexer using adiabatic logic R Singh, R Mehra International Journal of Advances in Engineering & Technology 6 (1), 246	35	2013
Image restoration using modified Lucy Richardson algorithm in the presence of Gaussian and motion blur S Sharma, S Sharma, R Mehra Advance in Electronic and Electric Engineering 3 (8), 1063-1070	33	2013
High Speed and Area Efficient 2D DWT Processor based Image Compression" Signal & Image Processing S Kaur, R Mehra arXiv preprint arXiv:1101.0262	32	2010
Area and power efficient CMOS adder design by hybridizing PTL and GDI technique A Sharma, R Mehra International Journal of Computer Applications 66 (4), 15-22	31	2013
Real time RSSI error reduction in distance estimation using RLS algorithm	30	2013

Cited by VIEW ALL

	All	Since 2015
Citations	1704	1474
h-index	21	19
i10-index	49	40



FACULTY RESEARCH PROFILE

CDC DEPARTMENT

Scopus Preview

Mehra, Rajesh

National Institute of Technical Teachers' Training and Research, Chandigarh,

https://orcid.org/0000-0002-8014-4922 View Mendeley profile

Edit profile Set alert Potential author matches Export

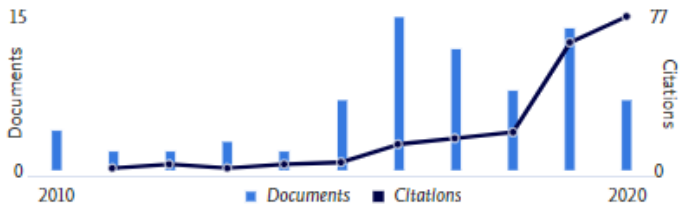
Metrics overview

77
Documents by author

206
Citations by **196 documents**

7
h-Index:

Document & citation trends



77 Documents | Cited by 196 Documents | 0 Preprints (New) | 7!

Note:

FACULTY RESEARCH PROFILE

CDC D

Meenakshi Sood

FOLLOW

Associate Professor
Verified email at nitttrchd.ac.in

Bio-Inspired Computing Biomedical Signal processing Antenna Design

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TITLE	CITED BY	YEAR
Genetic variability and association studies for green pod yield and component horticultural traits in garden pea under high hill dry temperate conditions A Sharma, M Sood, A Rana, Y Singh Indian Journal of Horticulture 64 (4), 410-414	46	2007
Relationship between severity of periodontal disease and control of diabetes (glycated hemoglobin) in patients with type 1 diabetes mellitus A Jindal, AS Parihar, M Sood, P Singh, N Singh Journal of international oral health: JIOH 7 (Suppl 2), 17	35	2015
Development of point of care testing device for neurovascular coupling from simultaneous recording of EEG and NIRS during anodal transcranial direct current stimulation U Jindal, M Sood, A Dutta, SR Chowdhury IEEE journal of translational engineering in health and medicine 3, 1-12	23	2015
NIRS-EEG joint imaging during transcranial direct current stimulation: online parameter estimation with an autoregressive model M Sood, P Besson, M Muthalib, U Jindal, S Perrey, A Dutta, M Hayashibe Journal of neuroscience methods 274, 71-80	22	2016
Gene action of yield-related traits in garden pea (Pisum sativum Linn.). M Sood, P Kalia SABRAO Journal of Breeding and Genetics 38 (1), 1-17	20	2006
Segmentation of MR images using hybrid kmean-graph cut technique J Dogra, S Jain, M Sood Procedia computer science 132, 775-784	12	2018
Corticospinal excitability changes to anodal tDCS elucidated with NIRS-EEG joint-imaging: An ischemic stroke study U Jindal, M Sood, SR Chowdhury, A Das, D Kondziella, A Dutta	11	2015

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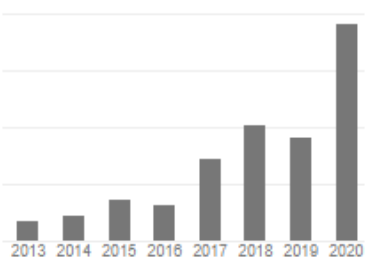
	All	Since 2015
Citations	421	371
h-index	10	9
i10-index	11	7



EXTENSTION SERVICES
&
CONSULTANCY

CONSULTANCY PROJECTS

CDC DEPARTMENT

TITLE OF PROJECT	CLIENT	AMOUNT IN LACS (APPROX.)	YEAR OF GRANT OF PROJECT
Revising the curriculum of certificate programme in Electrical Installation and Maintenance Works	Technical School Lagos, Nigeria	1.0 lac	2014
Development of Study Material in Electrical Installation and Maintenance Works	SIEL, Gurgaon	2 lacs	2016
Development of NSQF aligned Curriculum of 6 Diploma programmes	Punjab State Board of Technical Education	Rs. 15 lacs	2017
Development of NSQF aligned Curriculum of 6 Diploma programmes	State Board of Technical Education, Haryana	Rs. 18 lacs	2017

CONSULTANCY PROJECTS

CDC DEPARTMENT

	Client	Amount in lacs (approx..)	Year of grant of project
Design of Curriculum for NSQF aligned 9 certificate programmes	MRSPTU, Bathinda	Rs 9 lacs	2017
Design of Curriculum for NSQF aligned 5 diploma programmes	MRSPTU, Bathinda	Rs 9 lacs	2018
Development of NSQF aligned Curriculum of 6 Diploma programmes	State Board of Technical Education, UP	Rs. 17.70 lac	2018
Conversion of curriculum of 1st year 33 diploma programmes from semester system to annual pattern	State Board of Technical Education, Haryana	Rs. 7.19 lac	2018
Curriculum of 9 courses at UG level for AICTE, Delhi	AICTE, Delhi	2.59 lacs	2018
NSQF Compliant Curriculum Design	BTE Delhi	1.0 Crore (Approx)	2020
Curriculum Design	IED, UP	6.5 Lacs (Approx)	2020

MAJOR INITIATIVES & ACHIEVEMENTS

MAJOR INITIATIVES

CDC DEPARTMENT

- Conducting Symposium /Conference /Seminar /Workshop in emerging areas of curriculum development.
- Development of MOOCs modules in relevant areas.
- Funded Research projects for curriculum effectiveness.
- Extension and Consultancy services to various organizations related to curricula development activities.

MAJOR ACHIEVEMENTS

CDC DEPARTMENT

Name of Industry/Organization	
Board of Technical Education, Delhi	MOU signed with BTE, Delhi for design of 34 NSQF aligned curriculum
Telecom Sector Skill Council (TSSC), New Delhi	• Organizing train the trainees programmes for TSSC • Providing support in developing skill oriented curriculum

MAJOR ACHIEVEMENTS

CDC DEPARTMENT

1. Consultancy Projects for Internal Resource Generation
2. AICTE curriculum for 9 program
3. MOOC on Curriculum Implementation and Evaluation

FACULTY INTERNATIONAL EXPOSURE

FACULTY INTERNATIONAL EXPOSURE

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Faculty/Team	Activity undertaken	Agencies involved
Rajesh Mehra	i) Paper presented in International Conferences held at Attens (Greece) Dubai (UAE), Venice (Italy), Nice (France), Singapore. ii) Session chain in International Conference at Venice(Italy) iii)Participated in International Conference in Bangkok(Thailand) iv)Participated in TVET Programme at Manilla (Philippines)	Academic Agencies
Meenakshi Sood	Session chair in International Conferences Presented papers in International Conferences	Academic Agencies

FUTURE PLAN & ROADMAP

CDC DEPARTMENT

FUTURE PLAN & ROADMAP

1. Development of NSQF compliant curricula for Outcome Based Education at Regional and National level.
2. Funded Research Projects
3. MOOCs Development
4. Start of PG diploma in Adaptive Curriculum Design
5. Adaptive Curriculum Design roadmap in line with National Education Policy (NEP - 2020).