BIO-DATA

Assistant Professor
Department of Mechanical Engineering
Harcourt Butler Technical University, KANPUR-208002

Assistant Dean
Research and Development

Citation indices	All	Since 2010
Citations	72	68
h-index	4	4
i10-index	2	2

Dr. Sanjeev Kr Singh Yadav

Personal Details

Office Phone: 0512-2534001-05 (Ext.)
Office Fax: 0512-2534001
Mobile: 09721456055
E-mail: sanjeevyadav10@rediffmail.com , sanjeevyadav276@gmail.com
Father's Name: Er. S.N.S. Yadav
Place of Birth: Dist. Allahabad, Uttar Pradesh

Work Experience

Sl.No	Name of Institute/University	From the date	Till Date	Designation
1.	H.B.T.U Kanpur	19/01/2012	Continued	Assistant Professor, **7000/- AGP**
2.	H.B.T.I Kanpur	19/01/2007	18/01/2012	Assistant Professor, **6000/- AGP**
3.	Dr. B.R.A. University, Agra	July 2004	18/01/2007	Lecturer

Research Paper Publications

International Journals (9 Papers)

1. S.K.S Yadav and Vinod Yadava, V.L. Narayana, Experimental study and parameter design of electro discharge diamond grinding, International Journal of Advanced Manufacturing Technology, 36, 34-42, (2008). **(SCI, Publisher- Springer)**
2. S.K.S Yadav and Vinod Yadava, Experimental Investigation of Electrical Discharge Diamond Cut-off Grinding of Ti alloy, Materials and Manufacturing Processes, 28(5), 557-561(2013). **(SCI, Publisher- Taylor & Francis)**

3. S.K.S Yadav and Vinod Yadava, Experimental Investigations to Study EDDCG Machinability of Cemented Carbide. Materials and Manufacturing Processes. **(SCI, Publisher- Taylor & Francis)**
4. S.K.S Yadav and Vinod Yadava, Multi Objective Optimization of Electrical Discharge Diamond Cut-off Grinding(EDDCG) using Taguchi Method, International Journal of Manufacturing Technology and Industrial Engineering (IJMTIE),1(2), 193-198 (2010)
5. S.K.S Yadav and Vinod Yadava, Neural Network Modeling and Multi Objective Optimization of Electrical Discharge Diamond Cut-off Grinding (EDDCG), International Journal of Abrasive Technology (IJAT),4,346-362(2011)
6. S.K.S Yadav and Vinod Yadava, Simultaneous Optimization of Multiple Quality Characteristics in Electrical Discharge Diamond Cut-off Grinding (EDDCG), Applied Mechanics and Materials, 110-116, 250-257(2012)
7. S.K.S Yadav and Deepak Azad, ANN Modeling and Optimization of Electrical Discharge Machining Process, ELK Asia Pacific Journals - Special Issue (2015)
8. Kuldeep Kumar , Dr. S.K.S Yadav, Development and Experimental Study of Powder Mixed EDM for Cemented Carbide Work piece, Intl. J Engg Sci Adv Research 2015 Sep;1(3):144-149 (2015).
9. S.K.S Yadav "Modern approach for processing of advanced materials using EDM based Hybridizations- A Review" Global Journal of Multidisciplinary Studies (2015).

International Conferences (17 Papers)

1. S.K.S.Yadav and Vinod Yadava (2008), Experimental study of electrical discharge diamond grinding of HSS & carbide, International Conference at IIT, MADRAS, Dec. 15-17, 2008.
2. S.K.S.Yadav and Vinod Yadava (2012), Neural Network Modeling of Electrical Discharge Diamond Cut-off Grinding (EDDCG) of Ti-alloy. Proceeding of International Conference on Agile Manufacturing (ICAM 2012) IIT-BHU, December 17-19,pp: 312-314.
3. S.K.S.Yadav and Vinod Yadava (2012), Comparative Study of Electrical Discharge Grinding and Electrical Discharge Diamond Cut-off Grinding of Ti-alloy, Proceedings of 4th International All India Manufacturing Technology, Design and Research Conference (AIMTDR-12), at Jadavpur University, Jadavpur, December 14-16, pp:601-604.
4. S.K.S Yadav and Vinod Yadava (2012), Modeling and Experimental Study of Electrical Discharge Diamond Cut-off Grinding (EDDCG) of Cemented Carbide, 37thInternational MATADOR Conference, University of Manchester, Manchester U.K., July 25-27, pp: 75-78.
5. S.K.S Yadav and Vinod Yadava (2011), Simultaneous Optimization of Multiple Quality Characteristics in Electrical Discharge Diamond Cut-off Grinding (EDDCG) 2nd International Conference on Mechanical ,Industrial and Manufacturing Technologies (MIMT-10), SINGAPORE, Feb. 25-27, pp.604-608.
6. S.K.S Yadav and Vinod Yadava (2010), Artificial Neural Network Modeling of Electrical Discharge Diamond Cut-off Grinding (EDDCG) Proceeding of the 3rd International Conference on Global Trends and Challenges in Design and Manufacturing,Visakhapatnam,pp.271-275.
7. S.K.S Yadav and Vinod Yadava (2010), Multi Objective Optimization of Electrical Discharge Diamond Cut-off Grinding (EDDCG) using Taguchi Method Proceeding

of the 4th International Conference on Advances in Manufacturing Engineering, S.V. National Institute of Technology, Surat, September, 23-25,pp. 459-463.

8. S.K.S Yadav and Vinod Yadava (2013), Experimental Investigation on Processing of cemented carbide by EDCG and EDDCG: A Comparative Study, Smart Technologies for Mechanical Engineering, DTU, Delhi, October, 25-26.
9. Parametric Optimization of Electric Discharge Machine Through NN-GA Hybrid Technique Sustainable Manufacturing – Proc. of the International Conference on Sustainable Manufacturing: Issues, Trends and Practices (ICSM – 2011), BITS, Pilani, India, November 10-12, 2011
10. Shishupal Singh, Sanjeev K.S. Yadav, Praveen Verma, Ankur Srivastav, Vakalat Husain (2013), Emerging Trend of Use of UHMWPE Fiber Based Composite as Aircraft Building.ICCCCM-2013, UCR Allahabad, August 03-04.
11. S.K.S. Yadav, Deepak Azad (2015) ANN Modeling and Multi Objective Optimization of Electrical Discharge Machining Process. Advancements and recent Innovations in Mechanical, Production and Industrial Engineering, April 10-11, 2015.
12. S.K.S.Yadav, P.Kumar, A.K.Yadav, Recent Research and Development in Laser based Hybrid Machining Processes, Int. Conference on Application of Laser in Manufacturing, Sep. 9-11,2015, New Delhi, 54-55.
13. S.K.S.Yadav, V.Yadava, J.Ramkumar, Modern Approach for processing of Advanced Materials using EDM based Hybridizations- A Review, Int. conference on Multidisciplinary Research for the achievement of excellence in higher education & industry, Goa, India, 313, 2015.
14. Kumar Pravendra, Yadav S.K.S., Recent Research and Development in Ultrasonic based Hybrid Machining Processes. International Conference on Materials and Manufacturing Technology ICMMT – 2015, 3-4th December 2015,VVIT, Bangalore.
15. A.K.Yadav, S.K.S. Yadav" Experimental study of Zinc coated and bare electrode machining of Ni-alloy for EDM- A comparative study"International conference on precesion, Meso, Micro and Nano Engineering (COPEN-9) held during 10-12 December 2015, IIT Bombay, Powai, Mumbai.
16. Pravendra Kumar, S.K.S.Yadav "Optimization of powder mixed electrical discharge machining process for cemented carbide workpiece" International conference on precesion, Meso, Micro and Nano Engineering (COPEN-9) held during 10-12 December 2015, IIT Bombay, Powai, Mumbai.
17. Pravendra Kumar, S.K.S.Yadav "Current Research Trends and Developments in Electrochemical Assisted Machining Processes" International Conference of Advanced and Agile Manufacturing Systems, December 28-29, KNIT Sultanpur.

National Conferences (16 Papers)

1. S.K.S.Yadav and Vinod Yadava (2012), Machining challenges with advanced engineering materials, proceeding of the All India seminar on Advances in Materials and material selection in design at H.B.T.I. Kanpur, August 24-25.
2. R.N.Yadav, Vinod Yadava and S.K.S.Yadav (2012), Production and Processing of Metal Matrix Composites (MMCs): Challenges and Opportunities, Proceeding of the All India seminar on Advances in Materials and material selection in design at H.B.T.I. Kanpur August 24-25.
3. S.K.S.Yadav, Study of EDDG for carbide. Recent Advances in Mechanical Engineering, March 28-29, 2007, CAET, Etawah.

4. Study of Air Pollution Data in GIS Environment: A case study ,Advances in Management of energy efficiency and clean Environment at H.B.T.I. Kanpur,2010
5. Development and experimental study of tube hydro forming process,7-8 April 2011, ETME, IIMT, Noida.
6. Shishupal Singh, Sanjeev K.S.Yadav, Praveer Verma Repair and Life Estimation for Emergency Flotation System of Mi-8 Aircraft Material pp.51-56. Proceeding of the National Conference on Emerging Frontiers In Mechanical Engineering, H.B.T.I. Kanpur, February 15-16, 2014.
7. Kuldeep Kumar, S.K.S Yadav, Development and Experimental Study of Powder Mixed EDM, pp.103-108. Proceeding of the National Conference on Emerging Frontiers In Mechanical Engineering, H.B.T.I. Kanpur, February 15-16, 2014.
8. Deepak Azad, Sanjeev Kumar Singh Yadav, A Review of Recent Techniques used in Electrical Discharge Machining (EDM) Process. pp-109-112. Proceeding of the National Conference on Emerging Frontiers In Mechanical Engineering, H.B.T.I. Kanpur, and February 15-16, 2014.
9. Siddharth Yadav, Sanjeev K.S. Yadav, Apoorv Shrotriya Optimization of Die Design Parameters of Connecting Rod using FEM and Taguchi Methodology pp 171-176. Proceeding of the National Conference on Emerging Frontiers In Mechanical Engineering, H.B.T.I. Kanpur, and February 15-16, 2014.
10. Vevek Kumar, Yadvendra Singh, S.K.S.Yadav Multi Objective Optimization of Electrical Discharge Grinding using Taguchi Methodology. 215-220. Proceeding of the National Conference on Emerging Frontiers In Mechanical Engineering, H.B.T.I. Kanpur, February 15-16, 2014.
11. Arvind Kumar Yadav, S.K.S.Yadav Development of insulated electrode for minimum tool wear in EDM: A review, Proceeding of the National Conference on Paradigms in Mechanical Engineering, Manav Rachna International University, Faridabad, December 20, 2014.
12. Pravendra Kumar, S.K.S.Yadav Modelling and Optimization of Powder Mixed Electrical Discharge Machining Process: A Review, Proceeding of the National Conference on Paradigms in Mechanical Engineering, Manav Rachna International University, Faridabad, December 20, 2014.
13. S.K.S.Yadav and V.Yadava Experimental Modeling of Machining Processes- A Review National conference on Innovations in Materials, Design & Manufacturing held during 27-28 March. 2015.
14. S.K.S.Yadav and V.Yadava Multi Objective Optimization of Machining Processes: A Review National conference on Innovations in Materials, Design & Manufacturing held during 27-28 March. 2015.
15. J.Bhaskar, S.K.S.Yadav Challenges in Material Selection For Turbofan Engines, All India Seminar on Advanced in Engineering and Technology for Sustainable Development at G.B. Pant University, Pantnagar during June 12-13, 2015.
16. S.K.S. Yadav, J Bhaskar, V.Yadava Role of Diamond Abrasive in Grinding Processes – A Review, All India Seminar on Advanced in Engineering and Technology for Sustainable Development at G.B. Pant University, Pantnagar during June 12-13, 2015.

International Visit

Visited Singapore in Feb.2011 and presented a paper on Simultaneous Optimization of Multiple Quality Characteristics in Electrical Discharge Diamond Cut-off Grinding in 2nd

International Conference on Mechanical, Industrial and Manufacturing Technologies (MIMT 2011), SINGAPORE

Award /Appreciation

1. Received Best Paper award for engineering stream at All India Seminar on Advanced in Engineering and Technology for Sustainable Development at G.B. Pant University, PANTNAGAR during June 12-13, 2015.
2. Received Certificate of Appreciation by Director, HBTI for good conduction and management in State Level Faculty Interaction Seminar held during 8-9 June, 2015 at HBTI Kanpur.

Session Chair in Conference

1. Session Chaired in All India seminar on Advances in Materials and Material Selection in Design, Institution of Engineers (India) Kanpur local centre, H.B.T.I. Kanpur during 24-25 August 2012.
2. Session Chaired All India Seminar on Advanced in Engineering and Technology for Sustainable Development at G.B. Pant University, Pantnagar during June 12-13, 2015.

Short term courses/Workshops Attended

1. Advances in Manufacturing Technology, Feb 13-17, 2006, NITTTR, Chandigarh.
2. Micromachining, June 18-23, 2007, IIT, Kanpur.
3. Computer Aided Engineering, June 8-10, 2007, HBTI, Kanpur.
4. Applications of Mathematics in Engineering & Tech., Sep. 2007, HBTI, Kanpur.
5. Composite Materials; Potential & Challenges, Dec 28-29, 2007, HBTI, Kanpur.
6. Staff Development Programme on CAD & FEM, July 21-Aug 2, 2008, MNNIT, Allahabad.
7. ISTE-AICTE Sponsored short term training programme on Optimization Techniques for Engineers during 23-28 March, 2009.HBTI Kanpur.
8. Faculty Development Program on Essentials of Teaching Learning Process, March 18-23, 2013, HBTI, Kanpur.
9. National Workshop on Optimization Techniques & Their Applications, June 5-11, 2013, MNNIT, Allahabad.
10. One week short term course on Micro Manufacturing: Materials, Processes and Systems, July 08-12, 2013, MNNIT, Allahabad.
11. Workshop on Systems Engineering at IIT Kanpur, 16-20 December 2014.
12. One week short term school on 'Micro manufacturing and its application' March 31 – April 05, 2014 at IIT Kanpur.
13. Attended Workshop for Student, Faculty & Non Teaching staff satisfaction survey on 25/09/2014 at Kolkata, Organized by Project Coordinator, SPFU-WB NPIU New Delhi.
14. Short Term Course on Numerical Optimization Technique (NOT-2014), 31st Oct.-4th Nov, 2014 at MNNIT Allahabad.
15. Attended Workshop on Supply Chain Management, 4 -8 February, 2015 at IME, IIT Kanpur.
16. Attended Workshop on "MATLAB Programming and its Applications" during 25-26 February, 2015 at HBTI Kanpur.

17. Participated workshop on Virtual Laboratories on 15 March, 2015 at IIT Kanpur.
18. Attended workshop on Micro & Nano Fabrication from 16-20 March 2015 at IIT Kanpur
19. Attended workshop on Statistical Analysis for Engineers- 2015 during May 04-08, 2015 at IIT Kanpur
20. Participated in State Level Faculty Interaction Seminar during 8-9 June, 2015 at HBTI Kanpur
21. Summer Internship and Visiting Researcher Program at IIT Kanpur during 10 May-24 July 2015.
22. Participated in the MHRD's National Mission for Teachers and Administrators Management Capacity Enhancement Programme held at IIM Indore during August 24 to August 30, 2015.
23. Attended a Workshop on "NPTEL ONLINE COURSES" on September 24, 2015 organized by Dr. A.P.J. Abdul Kalam Technical University, Utter Pradesh, Lucknow and NPTEL, IIT Madras.
24. Participated in workshop on Microstructure Engineering via Heat Treatments from 19th October to 21st October 2015 at IIT Kanpur organized by Knowledge Incubation for TEQIP IIT K.
25. Attended IEEE CIS winter school on Computational Intelligence at IIT Kanpur from 14 to 16 December, 2015.
26. Participated FDP on Advance Algorithm in Computing from 25 -30 January 2016 at H.B.T.I Kanpur.
27. Attended a National Workshop on outcome based education and NBA Accreditation by SPFU from 01-03 July 2016.
28. Attended a TEQIP-II sponsored workshop on Intellectual Property Right and Patenting from 27-29 August 2016.
29. Attended TEQIP-II sponsored workshop during 3-5 October 2016.

Invited Lectures

1. A lecture delivered in AICTE sponsored staff development program on Advanced Manufacturing Processes during March 12-23, 2007 at MNNIT, Allahabad.
2. A special lecture delivered on the Topic "Computer Controlled Manufacturing Processes" on 15th Nov 2011 at DMSRDE Kanpur.
3. A special lecture delivered on the topic "Hybrid Manufacturing Processes" at All India seminar on Advances in Materials & Material selection in design Aug. 24-25, 2012 at Institution of Engineers, Kanpur Local Centre.
4. A lecture delivered in Faculty Development Programme on ENGINEERING EDUCATION: Opportunities, Challenges & Future Directions, March 7-12, 2014, at HBTI, Kanpur
5. A lecture delivered on Abrasive based Hybrid Micromachining Processes in short term course on Micro-manufacturing: Materials, Processes and Systems at MNNIT, Allahabad, June 17-21, 2014
6. A special lecture delivered on Manufacturing Processes at Ordnance Factories Institute of Learning, Kanpur, 23 -17 June 2014

7. A special lecture delivered on Advanced Manufacturing Processes at Ordnance Factories Institute of Learning, Kanpur, 23 -17 June 2014
8. A expert lecture delivered on Hybrid Machining Processes in short term course organized by Manav Rachana International University, Faridabad on 19/07/2014.
9. A expert lecture delivered on Advanced and Hybrid Machining Processes on 15 Nov. 2014 at PSIT Kanpur.
10. Presented Article Titled "AUTHORITIES ON CHALLENGES IN SUPPLY CHAINS" in Workshop on Supply Chain Management at IIT Kanpur on 6th February, 2015.
11. A expert lecture delivered on the topic of "Hybrid Machining Processes" in one week FDP on Manufacturing Science & Technology on 16 January 2016 organized by Azad Technical Campus, Lucknow.
12. A expert lecture delivered in Faculty Development Program at MED Organized by M.J.P. University, Bareilly on 27 April 2016.
13. Delivered a special Lecture on Recent Advancement and Futuristic Trends in Hybrid Machining Process at BBD Lucknow on 15 October 2016.

Research Projects

Sl. No.	Project Titled	Sponsored by	Cost	Duration
1.	Development, Experimental study and Multi-Objective Optimization of Electrical Discharge Drilling (EDD) Process	DST, SERB New Delhi (Under Young Scientist)	27 Lac 78 thousand six hundred	Three Years
2.	Experimental Study of Drilling Electro-Chemical Spark Machining (ECSM) setup	UPCST, Lucknow	7 Lac 98 Thousand	Three Years
3.	Development of Vibration Assisted Hybrid Machining Setup (Ph.D Student)	TEQIP-II	2 Lac 47 Thousand	Two years
4.	Development of Electrical Discharge Diamond Face grinding setup on ZNC Electrical Discharge Machining	TEQIP-II	1.10 Lac	One Year
5.	Development of electro-chemical discharge machining (ECDM) setup Co-PI- Dr.G.Bartarya	TEQIP-II	1 Lac	One Year
6.	Development of MMC setup Co-PI-Sri J.Bhaskar	TEQIP-II	1 Lac	One Year
7.	Development of Portable type Oxy- acetylene gas Welding setup (Completed in 2007)	TEQIP-I	15,000	6 Months

Apart from above research Projects four TEQIP-II sponsored B.Tech /M.Tech projects (cost less than 50 thousand) completed under my supervision

Thesis Supervised (M.Tech Thesis: 13 completed, 02 pursuing)

List of M.Tech Students along with Thesis Topic

S.N.	Name of students	Title of Thesis	Year of Completion	Place, Co-Supervisor
1.	Arvind Saroj (734/08)	Study on Design and Development of High Transparency, Light Weight Radome for Air Craft Application	2011	DMSRD, Sri P.Verma
2.	Naveen Sargam (Roll No.- 5604540003)	Neural Network Modelling and Experimental Study of Electrical Discharge Machining	2011	–
3.	Rajendra Kumar (S.R. No-736/09)	Failure Analysis of In-flight refulling system of supersonic Aircraft,s House	2013	DMSRD, Sri P.Verma
4.	Vivek Kumar (SR. No-739/09)	Multi Objective Optimization of Electrical Discharge Grinding using Taguchi Method	2013	–
5.	Brahm Bahadur Maurya (Roll No.-5504540018)	Comparative study of Copper and Aluminum tube through tube Hydro forming Process	2010	–
6.	Vakalat Husain (722/11)	Development of light weight polymer blend flame retardant material for passenger aircraft interior components	2013	DMSRD,Sri P. Verma
7.	Sishupal Singh (735/11)	Design, analysis and residual life estimation of rotary wing aircraft floatation system	2013	DMSRD, Sri P.Verma
8.	Kuldeep Kumar (6204540010)	Development and Experimental Study of Powder Mixed EDM for Cemented Carbide Workpiece	2014	–
9.	Deepak Azad (6204540007)	Modelling and Optimization of Electrical Discharge Machining Process using Neural Network	2014	–
10.	Arvind Kumar Yadav (721/13)	Development of Insulated Tool Electrode for Minimum Tool wear in EDM	2015	–
11.	Pravendra Kumar (726/13)-	Modelling and Optimization of Powder Mixed Electrical Discharge Machining Process for Cemented Carbide Workpiece	2015	–
12.	Milind Priya (743/14)	Internal Completed		
13.	Shivam Yadav (745/14)	Internal Completed		
14.	Pawan Kr.Yadav (712/15)	Pursuing		
15.	Sunit Kumar (717/15)	Pursuing		
16.	Anupma Katiyar (908/15)	Pursuing		
17.	Vandana Pandey (914/15)	Pursuing		

Research Interest

- Manufacturing Science Advanced Machining Processes, Production Engineering, Hybrid Machining Processes. Rapid Prototyping, Design of Experiment, Computational Intelligence.

PhD Ongoing - Two Ph.D Ongoing-One under TEQIP-II

1. **Gaurav Kumar Pandey (Under TEQIP-II)**
2. **Sunil Yadav**

Administrative Experience

- Held various responsibilities at Dr. B.R.A. University, Agra.
- Lab In-charge Manufacturing Science and CAM Lab from 17 March 2007 to till date.
- Developed Machining facility through procurement of ZNC EDM and USM at MED, HBTI Kanpur.
- Lab In-charge of MMC Lab from Aug 2008 to Aug.2011
- Organized SEE-10,UPTU Lucknow in 2010 and 2014 as a Center Superintended.
- Member of Expert Committee at DMSRD Kanpur.
- Organized CEPTAM, DRDO Examination in 2012 and 1st Feb. 2015 as observer.
- Faculty advisor of AME (Association of Mechanical Engineers). From 2007 to 2010
- Organized student national level Programme MECHARNIVAL- 2008, 2009 and 2010
- Hostel Warden WCH-III from August 2008 to June 2010
- Hostel Warden WCH-II from June 2010 to March 2013
- Sports Convener, HBTI, from March 2013 to 2015
- Security In-charge, HBTI, from July 2013 to 2015
- Organized SEE-15 as Nodal Officer at H.B.T.I Kanpur
- Member of Selection Committee at IIT Kanpur during 2014-15.
- Assistant Dean, Research and Development, HBTI Kanpur, from Oct.2015.
- Hostel Warden WCH-II from July 2016.

Extra Curricular Activities

- NCC 'C' Certificate, **Rank:** Under Officer.

Courses Taught

- **Undergraduate Level:** Advanced Manufacturing Processes, Manufacturing Science, Kinematics of Machines, Manufacturing Science and Engineering I and II, Machine Drawing, Measurement system, Machine Design.
- **Postgraduate Level**: Rapid Prototyping, A.I in Engineering, Advanced Manufacturing Processes, Machining Science, Neural Network and Fuzzy system.

Program Organized

1. Organized a National Conference on "**Emerging Frontiers in Mechanical Engineering"** as a Organizing Secretary, Under TEQIP-II, from 15-16 Feb.2014 at HBTI Kanpur
2. Organized Faculty Development Programme on **Engineering Education: Opportunities, Challenges & Future Directions**, From March 7-12, 2014. as Dy. Co-ordinator Under TEQIP-II.
3. Organized a Faculty Development Programme on **Advances in Engineering Materials** From March 16-21, 2009 as Dy. Co-Ordinator
4. Organized Annual Sports at HBTI in February 2014 as Convener.
5. Organized departmental student Annual function **'Mecharnival-2009'** as Convener.
6. Organized departmental student Annual function **'Mecharnival-2010'** as Convener.

- **Reviewer of Journal of Mechanical Engineering and Technology (JMET)**
- **Reviewed Books Manufacturing Tech. I&II by P.N.Rao.**

Life Member of THE INDIAN SOCIETY FOR TECHNICAL EDUCATION (ISTE)

Book Reviewed: *Manufacturing* By P.N.Rao Publisher **Tata McGraw Hill**