

## **Dr. BASAVARAJU MANU**

Assistant Professor,  
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### **PROFESSIONAL EXPERIENCE**

Assistant Professor, Department of Civil Engineering, NITK Surathkal (October 2009– present). Since 2008: h-index:5 and i-10 index:3

Lecturer, Department of Civil Engineering, NITK Surathkal (December 2007 – September 2009)

Reader, Department of Civil Engineering, MIT Manipal (August 2007- December 2007)

Lecturer, Department of Civil Engineering, MIT Manipal (February 2006- July 2007)

### **TEACHING AND RESEARCH INTERESTS**

(i) Principles of environmental engineering, (ii) Application of biological processes and advanced oxidation processes for water and wastewater treatment and (iii) Environmental management system

### **B.Tech., M.Tech. and Ph.D. Thesis Guidance**

#### **Ph.D. Thesis**

4 Awarded, and 5 ongoing.

#### **M.Tech. Thesis**

45 completed and 8 ongoing.

#### **B.Tech. Major Project**

11 completed (38 students) and 3 ongoing (10 students)

### **Book/Monograph**

1. Basavaraju Manu and Sanjeev Chaudhari, “Sequential Anaerobic-aerobic Treatment of Azo Dye Wastewater”, Scholar’s Press, Germany, 2014, 172 pages

### **ACADEMIC CREDENTIALS**

**Doctor of Philosophy (2006)**: Center for Environmental Science and Engineering, Indian Institute of Technology Bombay, Powai, Mumbai, India.

Title of thesis is “Sequential Anaerobic-Aerobic Treatment of Azo Dye Wastewater”.

**Master of Technology (2000)**: Center for Environmental Science and Engineering, Indian Institute of Technology Bombay, Powai, Mumbai, India

M.Tech thesis on “Physico-Chemical Treatment of Denim Process Wastewaters.”

Result: Cumulative Performance Index (CPI): 8.42/10 (First class with distinction)

**Bachelor of Engineering (1996)**: Department of Civil Engineering, Malnad College of Engineering, Hassan, Karnataka, India.

Project: “Layout, Analysis and Design of a Multi-Storeyed High School Building”.

Result: Passed in First class with distinction (77%)

### **PERSONAL INFORMATION**

Date of birth: 10/02/1974      Age: 41 yrs.

Place of birth: T.Narasipur, Mysore district, Karnataka, India

Sex: Male

Marital status: Married (Two sons)

Languages known: English, Kannada and Hindi (to read and write)

### **ACADEMIC ACHIEVEMENTS**

1. MHRD, GOI Fellowship for pursuing masters degree during July1998-January2000
2. MHRD, GOI Fellowship for pursuing doctoral studies during January2000-January2005
3. Merit incentive award for securing highest marks in an elective in final semester B.E examination – Industrial Wastes and Air Pollution.

### **PROFESSIONAL ACHIEVEMENTS**

1. Visited Professor Eakalak Khan, Environmental Engineering Division of North Dakota State University (NDSU), Fargo, North Dakota, USA during November 16 – December 01, 2008 as a part of research interaction of TEQIP program
2. Reviewed a book entitled “Principles of Environmental Engineering Science” authored by M.L. Davis and Susan J Masten, 2nd Edn., 2009, McGraw-Hill Publishers, New-Delhi.
3. Reviewer for research article submitted to various Journal, Elsevier publishers, England, IWA, UK.
4. Reviewed manuscripts submitted to 2<sup>nd</sup> International Conference on Current Trends in Technology NUiCONE 2011 held at Institute of Technology, Nirma Univeristy, Ahmedabad, India during December 8-10, 2011.
5. M.Tech. thesis examiner (external) for MIT, Manipal and SJCE, Mysore.

### **PUBLICATIONS IN INTERNATIONAL JOURNALS**

1. Manu B and Sanjeev Chaudhari,"Anaerobic Decolorisation of Simulated Textile Wastewater Containing Azo Dyes ", *Bioresource Technology*, Vol. 83, No.3, pp. 225-233, 2002 (cited by 119 times in [www.scopus.com](http://www.scopus.com) ; world's largest database for scientific and technical articles).
2. Manu B and Sanjeev Chaudhari,"Decolorization of Indigo and Azo Dyes in Semi-Continuous Reactors With Long Hydraulic Retention Time ", *Process Biochemistry*, Vol. 38, No.8, pp. 1213-1221, 2003 (cited by 113 times in [www.scopus.com](http://www.scopus.com) ; world's largest database for scientific and technical articles).
3. Manu B, “Physico-Chemical Treatment of Indigo Dye Wastewater”, *Coloration Technology*, Vol. 127, No. 3, pp. 197-202, 2007. (cited by 13 times in [www.scopus.com](http://www.scopus.com) ; world's largest database for scientific and technical articles)
4. Manu, B., Mahamood, Vittal, H and Shrihari, S. (2011). “A novel catalytic route to degrade paracetamol by Fenton process.” *Int. J. Res. Chem. Environ.*, 1 (1), 157-164.
5. Manu, B. and Mahamood. (2011). “Enhanced degradation of paracetamol by UV-C supported photo-Fenton process over Fenton oxidation.” *Water Sci. Technol.*, 64 (12), 2433 - 2438.
6. Manu, B. and Mahamood. (2011). “Degradation of Paracetamol in Aqueous Solution by Fenton Oxidation and Photo-Fenton Oxidation Processes Using Iron from Laterite Soil as Catalyst.” *Int. J. Earth sci. Eng.*, 4 (6), 1103 - 1110.
7. Shrikant, S. J., S. Shrihari and B. Manu. (2012). “Reuse of Textile Mill Sludge in Cement Based Solid Blocks”, *International J. of Engg. Research & Indu. Appls.*, 5 (3), 213-224.
8. Basavaraju Manu and Mahamood (2012), “Degradation Kinetics of Diclofenac in Water by Fenton’s Oxidation”, *Journal of Sustainable Energy & Environment*, 3, 173-176
9. Rahul Karale, Basavaraju Manu and S.Shrihari (2013), “Degradation of Toxic 2-Aminopyridine Pharmaceutical Compound from Aqueous Environments Using Advanced Fenton and Photo-Fenton Oxidation Processes”, *International Journal of Advanced Technology in Civil Engineering*, 2(1), 34-38.
10. Rahul Karale, Basavaraju Manu and S.Shrihari (2013), “Catalytic Use of Laterite Iron for Degradation of 2-Aminopyridine Using Advanced Oxidation Processes”, *International Journal of Scientific & Engineering Research*, 4(5), 207-210.
11. Vijay Kumar Pujar and B.Manu (2013), “Biodegradation of Bromopyridine Using Sequential Batch Reactors”, *International Journal of Environmental Research and Development*, 3(7), 73-77.

12. Rahul S.Karale, Basavaraju Manu, S.Shrihari (2014), "Fenton and Photo-Fenton Oxidation Processes For Degradation of 3-Aminopyridine From Water", APCBEE Proceedia, 9, 25-29
13. Vinayak Patki, S.Shrihari and B.Manu (2013), "Fuzzy system modelling for forecasting Water Quality Index in Municipal Distribution System", Urban Water, DOI: 10.1080/1573062X.2013.820333.
14. Vinayak K. Patki, S. Shrihari and B. Manu (2013), "Water Quality Index in Municipal Distribution System for Solapur city, Maharashtra State, India", International Journal of Environmental Protection, 3(6), 16-23.
15. Shrikant S Jahagirdar, S. Shrihari and B. Manu, (2013) "Reuse of Textile Mill Sludge in Burnt Clay Bricks", International Journal of Advanced Technology in Civil Engineering, 2(1), 96-99.
16. Shrikant S Jahagirdar, S. Shrihari and B. Manu, (2013) "Utilization of Textile Mill Sludge in Burnt Clay Bricks", International Journal of Environmental Protection, 3 (5), 6-13
17. Patki V.K., Shrihari S and Manu, B (2013) "Water Quality Prediction in Distribution System Using Feed Forward Neural Network", International Journal of Advanced Technology in Civil Engg., 2(1), 84-91
18. Shrikant S Jahagirdar, Surathkal Shrihari, and Basavaraju Manu (2015), "Reuse of Incinerated Textile Mill Sludge as Adsorbent for Dye Removal", KSCE Journal of Civil Engineering, DOI 10.1007/s12205-015-0731-3
19. TN Shridhara, DM Chethan, B Manu, N Indresh (2014), "Degradation of Para-Phenylenediamine in Aqueous Solution by Photo-Fenton Oxidation Processes", Science, Technology and Arts Research Journal 3 (2), 88-92.

#### **PUBLICATIONS IN NATIONAL JOURNALS**

1. Basavaraju Manu and Mahamood. (2012), "Fenton's oxidation of amoxicillin in water", NITK Research Bulletin, 21 (2), 30-38.
2. Rahul Karale, Basavaraju Manu and S.Shrihari. (2013), "Treatment Options for Pharmaceutical Wastewater Containing Toxic Pyridine Compounds: A Review", NITK Research Bulletin, 22(1), 42-52

#### **PROCEEDINGS IN INTERNATIONAL CONFERENCE**

1. Manu B and Sanjeev Chaudhari, "Anaerobic and Hydrogen Peroxide Decolourization of Azo Dyes: A Comparative Evaluation", Proceedings of the 28th WEDC International Conference on Sustainable Environmental Sanitation and Water Services, 18-22nd November, Kolkata, India, 2002 (Oral presentation)
2. Ganesha A and Manu B, "Characterisation and Treatment of a Fish Processing Industry Wastewater: A Case Study", Third International Ground Water Conference (IGC-2007) on Water, Environment and Agriculture – Present Problems and Future Challenges, 7-10th February, Coimbatore, India, 2007 (Oral presentation).
3. Manu B, "Performance Evaluation of an Anaerobic Sequencing Batch Reactor Fed with Rice Mill Industry Wastewater", International Conference on New Horizons in Biotechnology (NHBT 2007), NIST, Trivandrum, Kerala, India 26-29 November, 2007. (Poster presentation).
4. Manu B, "Environmental Implications of an Inverted Ecological Pyramid", Role of Engineering Towards a Better Environment 08 (RETBE08), Faculty of Engineering, Alexandria University, Egypt, 20-22 December 2008.
5. B. Manu and Sujay S, "Laterite Soil As A Source of Iron Catalyst During Fenton's Oxidation of Nitrophenol Containing Aqueous Solutions", International Conference on Recent Trends in Materials and Characterization (RETMAC 2010), NITK, Surathkal during 14-15<sup>th</sup> February 2010.
6. Sanjeev .S. and Basavaraju. Manu, "Treatment of 2- Fluorophenol Containing Aqueous Solutions Using Fenton's Reagent, International Conference on "Emerging Technologies for Sustainable Environment" held at Aligarh Muslim University, during October 29-30, 2010.

7. Mohd Omair, Mahamood and Basavaraju Manu, "Biodegradation of Selected Pharmaceutical Chemicals Using SBR", 3<sup>rd</sup> International Geography Congress, held at CWRDM, Calicut, Kerala, India during 6-8<sup>th</sup> May, 2011.
8. Riyaz Ahammed and Basavaraju Manu, "Biodegradation of 2-Chlorophenol and 2,4-Dichlorophenol using Sequential Batch Reactor", 3<sup>rd</sup> International Geography Congress, held at CWRDM, Calicut, Kerala, India during 6-8<sup>th</sup> May, 2011.
9. Basavaraju Manu and Mohammed Yaseen, "Degradation of Nitrophenol in Water by sequential Anaerobic-Aerobic Treatment", International conference on Ecological, Environmental and Biological Sciences (ICEEBS 2012), Dubai, UAE, 7-8<sup>th</sup> January, 2012
10. Basavaraju Manu and Nagaraj K, "Biodegradation of Acetaminophen by Microbial Consortium of Domestic Sewage Sludge", IV International Conference on Environmental, Industrial and Applied Microbiology (BIOMICROWORLD 2011) Malaga Spain, 14-16<sup>th</sup> September, 2011.
11. Rahul.S. Karale, Basavaraju Manu and S.Shrihari, "Fenton and Photo-Fenton Oxidation Processes to Degrade 3-Aminopyridine from Aqueous Environments -Novel Catalytic Use of Laterite Iron" International conference on recent advances in material science & technology-2013 (ICRAMST-13) January 17 to 19 , 2013, NITK, Surathkal, Karnataka, India.
12. Evaluation of Impact of Genotoxic Pollutants in the Term of DNA Integrity in *Nerita Chamaeleon* along the Goa Coast Vipin Singh, B.Manu, Madhyastha MN and A.Sarkar International conference on recent advances in material science & technology-2013 (ICRAMST-13) January 17 to 19 , 2013, NITK, Surathkal, Karnataka, India.
13. Basavaraju Manu and Dibya Ranjan Dash, Biodegradation of fluorophenol using sequential batch reactor, 4<sup>th</sup> IWA Asia Pacific Young Water Professional (APYWP 2012) conference, Miraikan, Tokyo, Japan during 7-10, December, 2012.
14. Basavaraju Manu and Udaya A.K. "Photo-Fenton's Oxidation of Chlorophenols Containing Aqueous Solution", 2<sup>nd</sup> International conference on Advanced Oxidation Processes, 2012 held at Kottayam, Kerala from 5-8<sup>th</sup> October 2012.
15. Rahul Karale, Basavaraju Manu and S.Shrihari, "Degradation of Toxic 2-Aminopyridine Pharmaceutical Compound From Water Matrix Using Advanced Fenton and Photo-Fenton Oxidation Processes", 2<sup>nd</sup> International Conference on Recent Trends in Engineering and Technology (ICTRET 2013) held at SNJB's Late Sau. Kantabai Bhavarlalji Jain College of Engineering , Chandwad, Nashik, Maharashtra, India during 22<sup>nd</sup> to 24<sup>th</sup> February, 2013.
16. Rekha Rao, B.Manu and C.V.Rao, "Toxicity Study of Amoxicillin in Freshwater Fish *Cyprinus Carpio*", Environmental Health, 3-6<sup>th</sup> March, 2013, Boston, USA.
17. Vijay Kumar Pujar and B.Manu, "Biodegradation of Bromopyridine Using Sequential Batch Reactor", International Conference on Sustainable Innovative Techniques in Civil and Environmental Engineering (SITCEE 2013) held at JNU, New Delhi during 5-6<sup>th</sup> June, 2013.
18. Vipin Singh, B.Manu, M.N. Madhyastha, Gaurav Sarker and A.Sarkar "Catalase Activity and Level of Lipid Peroxidation in *Nerita Chamaeleon* as an indicator of oxidative stress in marine Environment", International conference on Development and Prosperity of Nation Through Young Minds, held at Bhopal, (M.P), India during 12-13 December, 2013 {2<sup>nd</sup> prize for Best paper}.
19. Rahul S Karale, Basavaraju Manu and S.Shrihari, " Enhanced Degradation of Pharnaceutical Halogenated 2-Bromopyridine Compound From Water Using Photo-Fenton Oxidation Process", International Symposium on Halogenated Persistent Organic Pollutant (IEEP) 2014, January, 16-17, 2014, NEERI, Nagpur, Maharastra, India.
20. B.Manu and N.Piraiyyamutham, "Sequential Anaerobic-Aerobic Batch Reactor Setup for the Degardation of 2-Nitroaniline and 3-Nitroaniline", International Symposium on Halogenated Persistent Organic Pollutant (IEEP) 2014, January, 16-17, 2014, NEERI, Nagpur, Maharastra, India.

#### **PROCEEDINGS IN NATIONAL CONFERENCE**

1. Manu B, "Municipal Solid Waste Management Options for a Newly Formed and Rapidly Growing Indian Urban City/Municipality, Enviro 2006 National Conference on Environmental Degradation and Pollution Control and 23rd National Convention of IPHE on Environmental Engineering (23NCEE), 28-30th December, Coimbatore, India, 2006. (Oral presentation, Also chaired a technical session).
2. Manu B and Vineet VijayKumar, "Enviro-Health Impacts of Manufacture and Use of Cell Phones", MACRO-08: National Conference on Eco-Friendly Plastics and Rubber Systems (NCEPRS), SJCE, Mysore, Karnataka, India, 19-20th May, 2008.
3. Manu B, "Potable Water Management of a Coastal City: A Unique Case Study of Mangalore", Indian Engineering Congress, NIT Warangal, Andhra Pradesh, India, 11-14 December 2008.
4. S. Sanjeev and B.Manu, "Treatment of Fluorophenol containing Aqueous Solution Using Fenton's Reagent", The National Conference on Sustainable Water Resources Management (SWaRM2010), held at NITK, Surathkal during 7-9<sup>th</sup> January 2010.
5. Manu, B. and Mahamood. "Advanced Oxidation of Diclofenac in Aqueous Solution by Fenton Process: Use of Iron Extracted from Lateritic Soil as Catalyst." 27th Convention of Environmental Engineers on "Green Technology", Institution of Engineers (India), Mangalore, Karnataka State, India, 24 – 25 January, 2012, 1 – 9.
6. Manu, B. and Mahamood, "Fenton's Oxidation of Diclofenac in Water: A Kinetic Study." National Conference on Contemporary Civil Engineering Research & Practices (CCERP – 2012), Manipal Institute of Technology, Manipal, Karnataka State, India, 20 – 21 April, 2012, 508 – 517.
7. Vinyak Patki, S.Shrihari and B.Manu, "Soft Computing for Water Quality Assessment and Prediction", 27th Convention of Environmental Engineers on "Green Technology", Institution of Engineers (India), Mangalore, Karnataka State, India, 24 – 25 January, 2012.
8. B. Manu and Anupama, "Treatment of Coffee Wastewater Using Sequential Anaerobic-aerobic-Advanced Oxidation Processes for Possible Reuse/Recycle", Conference on Water Conservation and Management (WCM-2011) held at NITK, Surathkal on March 22<sup>nd</sup> 2011.
9. Indresh N and B.Manu, "Fenton's Oxidation for the Treatment of Water containing Phenylenediamines", Conference on Water Conservation and Management (WCM-2011) held at NITK, Surathkal on March 22<sup>nd</sup> 2011.
10. Arindam Sinha Roy, B. Manu, S. Shrihari, Rahul Karale, "Degradation of 2-Pyridineamine Using Photo-Fenton Oxidation", National Conference on New Horizons in Civil Engineering – NHCE 2013, April 12-13, 2013, M.I.T, Manipal

**CONFERENCES, WORKSHOPS, TRAINING PROGRAMMES: ORGANISED, ATTENDED, PARTICIPATED**

1. Co-ordinator, "Two Day Workshop on "Training of Environmental Science and Engineering Professor (How to conduct courses in Environmental Management and Sustainability)", September 20-21, 2013, sponsored by TEQIP-II, NITK, Surathkal.
2. Co-ordinator, "Two-Day Workshop on "Disaster Management of Floods and Consequences Thereof in Coastal Regions and Food and Water Security", February 4-5, 2013 jointly organized by NITK, Surathkal and IEI Mangalore Local centre.
3. WORLD WATER DAY-2007, "Coping With Water Scarcity", A Half-day Technical Programme held at MIT, Manipal on 23th March, 2007. (Co-organiser)
4. IIT Bombay National Conference on Advances in Environmental Science and Engineering, Organised by Centre for Environmental Science and Engineering (CESE), December 8-9, 2003, Indian Institute of Technology, Bombay, Mumbai. (Organizing committee member).
5. "Sustainable Development for Smaller Footprint", National seminar organized by Department of Civil Engineering, MIT, Manipal, March 8-9, 2007 (Organizing committee member).
6. Two-Day workshop on Geoinformatics for Natural Resources Management, Department of Applied Mechanics and Hydraulics, NITK, Surathkal, 30-31<sup>st</sup> January, 2013
7. One Day Workshop on "Workplace Sensitization" organised by NITK, Surathkal on 22/11/2013 at NITK, Surathkal.

**Number of short term courses conducted**

1. CCE-NITK refresher course "Low Cost Design of Wastewater Treatment" for PWD engineers, Government of Karnataka (17 participants) at NITK, Surathkal during 26/07/2010 to 30/07/2010.
2. CCE-NITK refresher course "Environmental Impact Assessment" for PWD engineers, Government of Karnataka (12 participants) at NITK, Surathkal during 08/08/2011 to 12/08/2011.

**Number of AICTE short term courses attended**

1. AICTE and ISTE, New-Delhi sponsored Summer School on Recent Development in Advanced Materials, Department of Mechanical Engineering, NITK, Surathkal during 16-21 June, 2008 and Faculty Awareness Camp on Entrepreneurship during 22-24, June 2008.
2. AICTE-MHRD, New Delhi sponsored Summer School on Water Resources Development and Management, Department of Applied Mechanics and Hydraulics, NITK, Surathkal during 28<sup>th</sup> July to 8<sup>th</sup> August, 2008.
3. AICTE sponsored Faculty Development Program on Environmental Impact Assessment of Infrastructural Projects, NIT Calicut during 25-30<sup>th</sup> May, 2009.
4. AICTE-MHRD sponsored Summer school on Soft Computing Techniques in Water Resources Engineering, Department of Applied Mechanics and Hydraulics, NITK, Surathkal during 5-9<sup>th</sup> July, 2010.
5. AICTE-MHRD sponsored Summer school on Fuzzy Logic, Genetic Algorithm with Wavelet Transformation in Civil Engineering, Department of Applied Mechanics and Hydraulics, NITK, Surathkal during 27<sup>th</sup> June to 1<sup>st</sup> July, 2011.

**Invited expert/guest lectures delivered**

1. Colour Removal of Azo Dye Wastewater Using Biological Methods For Possible Reuse/Recycle – A guest lecture delivered on 20/08/2007 in department of Civil engineering at College of Kopergaon, Kopergaon, Maharashtra.
2. Sequential Anaerobic-Aerobic Treatment of Azo Dye Wastewater for Possible Reuse/Recycle on 25/11/2008, North Dakota State University, USA.
3. Environmental Quality Monitoring Using Software Technology on 18/02/2009 at ESCI Hyderabad
4. Advanced Environmental Management during 16-18/03/2009 at SDM CET, Dharwad.
5. "Vehicular Air Pollution" - Vehicular Air Pollution Control Week, Organised by RTO, Mangalore at St. Aloysius College, Mangalore on 7/11/2011
6. Guest lecture on "Anaerobic Treatment of Wastewater", NIT Trichy on 12/11/2013

**TECHNICAL SKILLS**

Working experience of instruments related to sampling and analysis of water and wastewater including High-Performance Liquid Chromatograph (HPLC), Gas Chromatograph (GC), Atomic Absorption Spectro-Photometer (AAS), Fourier-Transformed Infra Red Spectroscopy (FT-IR), UV-Visible Spectrophotometer, etc.

Design Effluent treatment plants for fish meal industry, plywood manufacturing industry, town municipal corporation.

**COMPUTER SKILLS**

Knowledge of C, C++, Fortran, Windows and Unix, Windows applications such as MS Office, Water Supply Design Software packages and Wastewater Treatment Design Software packages.

**EXTRA-CURRICULAR ACTIVITIES**

- a) Attended and participated in various workshops and conferences organized at the department and institute level.
- b) Efficient in technical report writing and presenting it.
- c) Would like to lead a team and/or would like to work in a team in executing a project or organizing an event.
- d) Practicing yoga/meditation, public speaking and watching nature related programs on TV.

**AFFILIATIONS**

- 1. Senior Member (100194 – 2011) – Asia-Pacific Chemical, Biological and Environmental Engineering Society (APCBEEES), Singapore.
- 2. Senior Member (SNM1005464) – Universal Association of Civil, Structural and Environmental Engineers (UACSE), The institute of Research Engineers and Doctors, USA .
- 3. Life Member (LM.No.133), Society of Environmental Chemistry and Allied Sciences, Kottayam, Kerala, India.
- 4. Life Member (LM 57065), Indian Society for Technical Association, New-Delhi, India
- 5. Life Member (LM 6754), Indian Water Works Association, Mumbai, India.
- 6. Life Member (LM-1087), National Environmental Science Academy, New Delhi, India
- 7. Member, World Academy of Science, Engineering and Technology
- 8. Life Member (027-KAR21-L09125) – Youth Hostels Association of India, New-Delhi, India