

## ***CURRICULUM VITAE***

(August, 2016)



### **ERICK R. BANDALA**

Division of Hydrologic Sciences, Desert Research Institute.

E-mail: [erick.bandala@dri.edu](mailto:erick.bandala@dri.edu);

PHONE: (702) 862 5395

**Country of Birth: Mexico**

**Citizenship: Mexican**

### **Education**

<b>Degree Awarded</b>	<b>Field</b>	<b>Institution</b>	<b>Date</b>
PhD	Engineering	UNAM	2004
MS	Organic Chemistry	Morelos State University	1997
BS	Chemical Engineering	Veracruz State University	1991

### **Professional Positions**

January 2016-Present. Assistant Research Professor. Division of Hydrologic Sciences. Desert Research Institute. Las Vegas, NV, USA.

April 2013-December 2015. Full Professor. Department of Chemical, Food and Environmental Engineering. Universidad de Las Américas-Puebla, Mexico.

August-December, 2014. Visiting Professor. Department of Environmental Technology and Design. Appalachian State University. Boone, NC, USA

2007-2013 Associate Professor. Department of Civil and Environmental Engineering. Universidad de Las Américas-Puebla, Mexico.

2009-2013 Graduated Studies Director. Department of Civil and Environmental Engineering. Universidad de Las Américas-Puebla, Mexico.

1993-2007 Titular Researcher. Mexican Institute of Water Technology (IMTA), Ministry of Environment, Mexico.

1998-2007 Adjunct Professor. Department of Civil and Environmental Engineering. National Autonomous University of Mexico, Mexico.

## Honors and Awards

1. Fall 2014, Visiting Professor. Department of Environmental Technology and Design, Appalachian State University, USA.
2. 2013 UDLAP Distinguished Teaching Award
3. Puebla State Science and Technology Award 2012 in Environmental Technology, Sustainable Development and Renewable Energy.
4. Professional Hydrologist Water Quality. American Institute of Hydrology. July, 2010 (Certification Number 10-HWQ-2008).
5. Puentes Consortium Fellow (2010-2012).
6. Rice International Visiting Fellow on Energy, the Environment and Sustainability 2008-2009.
7. National Researcher (Level II). National Council of Science and Technology-Mexico 2013 to date.
8. National Researcher (Level I). National Council of Science and Technology-Mexico 2004-2013.
9. Visiting Professor. School of Civil and Agricultural Engineering. Universidad de Concepción, Chile 2004 and 2008.
10. Invited Researcher. Plataforma Solar de Almería, Spain 2000.

## Scientific publications

### ***Refereed journal articles (peer-reviewing)***

1. Duran-Encalada J.A., Paucar-Caceres A., Bandala E.R., Wright G.H. 2016. The impact of global climate change on water quantity and quality: A system dynamics approach to the US-Mexican transborder region. **European Journal of Operational Research** (In press).
2. Martinez P., Bandala E.R. 2016. Maximum temperatures and heat-waves in Mexicali, Mexico: Trends and thresholds' analysis. **Air, Soil and Water Research** 9, 21-28.
3. Bandala E.R., Patino-Gomez C. 2016. Appropriate technology and climate change adaptation. **Physics and Chemistry of Earth** 91,1.
4. Bustos-Terrones Y., Rangel-Peraza J.G., Sanhouse A., Bandala E.R., Torres L.G. 2016. Degradation of organic matter from wastewater using advanced primary treatment by O<sub>3</sub> and O<sub>3</sub>/UV in a pilot plant. **Physics and Chemistry of Earth** 91, 61-67.
5. Perez L.S., Rodriguez O.M., Reyna S., Sanchez-Salas J.L., Lozada J.D.,

- Quiroz M.A., Bandala E.R. 2016. Oil refinery wastewater treatment using coupled electrocoagulation and fixed film biological processes. **Physics and Chemistry of the Earth** 91, 53-60.
6. Velez-Lee E., Cordova-Lozano F., Bandala E.R., Sanchez-Salas J.L. 2016. Cloning and expresion of vgb gene in *Bacillus cereus*, improve phenol and p-nitrophenol biodegradation. **Physics and Chemistry of the Earth** 91, 38-45.
  7. Auriolos-Lopez V., Polo-Lopez M.I., Fernandez-Ibañez P., Lopez-Malo A., Bandala E.R. 2016. Effect of iron salt counter ion in dose-response curves for inactivation of *Fusarium solani* in water through solar driven Fenton-like processes. **Physics and Chemistry of the Earth** 91, 46-52
  8. Martínez-Austria P.F., Bandala E.R., Patiño C. 2016. Temperature and heat wave trends in northwest Mexico. **Physics and Chemistry of the Earth** 91, 20-26.
  9. Bustos Y.A., Rangel-Peraza J., Rojas-Valencia N., Bandala E.R., Alvarez-Gallegos A., Vargas-Estrada L. 2015. Treatment of industrial effluents by electrochemical generation of H<sub>2</sub>O<sub>2</sub> using a FVC cathode in a parallel plate reactor. **Environmental Technology** 1-13.
  10. Lopez-Ayala S., Rincon M.E., Quiroz-Alfaro M.A., Bandala E.R., Mendez-Rojas M.A., Castaño V.M. 2015. Nanocrystalline titania doped by metal precursors in the photocatalytic degradation of 2,4-D sodium salt. **Journal of Photochemistry and Photobiology A: Chemistry** 311, 166-175.
  11. Romero-Zarazua M.F., Sánchez-Salas J.L., Quiroz M.A. Bandala E.R. Méndez-Rojas M.A. 2015. Occupational exposure to heavy metals in a metal-mechanical auto part manufacturing plant in Puebla, Mexico. **International Journal of Environmental Health Engineering** 4(1), 8-15.
  12. Castillo-Ledezma J.H., Rodriguez F.J., Lopez-Malo A., Sanchez-Mora E., Quiroz M.A., Bandala E.R. 2015. Synthesis, structural characterization and photocatalytic activity of iron-doped titanium dioxide nanopowders synthesized by co-precipitation. **Journal of Technology Innovations in Renewable Energy** 4(1), 1-9.
  13. Sanchez-Arreola E., Martín-Torres G., Lozada-Ramírez J.D., Hernandez L.R., Bandala E.R., Bach H. 2015. Biodiesel production and de-oiled seed cake nutritional values of a Mexican edible *Jatropha curcas*. **Renewable Energy** 76, 143-147.
  14. Castillo-Ledezma J.H., Lopez-Malo A., Pelaez M.A., Dionysiou D.D., Bandala E.R. 2014. Modeling the enhanced photocatalytic photocatalytic solar disinfection of Escherichia coli using Nitrogen-doped TiO<sub>2</sub>. **Journal of Surfaces and Interfaces of Materials** 2 (4), 1-9.
  15. Molina J., Zúñiga C., Gutierrez E., Mendoza E., Sanchez J.L., Bandala E.R. 2014. Carrier Photogeneration in Metal-Semiconductor Structures Using Thin Films of Rutile-Phase TiO<sub>2</sub> Nanoparticles. **International Journal on Advances in Systems and Measurements** 7(1-2), 34-43.
  16. Bustos Y., Vaca M., López R., Bandala E.R., Torres L., Rojas-Valencia N. 2014. Disinfection of primary municipal wastewater effluents using continuous UV and ozone treatment. **Journal of Water Resource and Protection** 6, 16-21.
  17. Molina J., Zuñiga C., Moreno M., Calleja W., Rosales P., Ambrosio R.C., De

- la Hidalgo F.J., Gutierrez E., Sanchez J.L., Bandala E.R. 2014. Physical and electrical characterization of TiO<sub>2</sub> particles after high temperature processing and before/after UV irradiation. **Canadian Journal of Physics**. 92, 832-837.
18. Quiroz M.A., Sanchez-Salas J.L., Reyna S., Bandala E.R., Peralta-Hernandez J.M., Martínez-Huitle C. 2014. Degradation of 1-hydroxy-2,4-dinitrobenzene from aqueous solutions by electrochemical oxidation: role of anodic material. **Journal of Hazardous Materials** 268, 6-13.
  19. Molina J., Sanchez-Salas J.L., Zuñiga C., Mendoza E., Cuahtecotzi R., García-Perez G., Gutierrez E., Bandala E.R. 2014. Low temperature processing of thin films based on rutile TiO<sub>2</sub> nanoparticles for UV photocatalysis and bacteria inactivation. **Journal of Material Sciences** 49, 786-793.
  20. Molina J., Zúñiga C., Mendoza E., Sanchez-Salas J.L., Gutierrez E., Bandala E.R. 2013. Using thin films of rutile-phase TiO<sub>2</sub> nanoparticles as photoactive materials in metal-semiconductor structures with low thermal processing. **Energy and Environmental Focus** 2(4), 299-306.
  21. Bandala E.R., Tiro J.B., Lujan M., Camargo F.J., Sánchez-Salas J.L., Reyna S., Moeller G., Torres L.G. 2013. Petrochemical effluent treatment using natural coagulants and an aerobic biofilter. **Advances in Environmental Research** 2(3), 229-243.
  22. Zamudio-Perez E., Bandala E.R., Fernandez L.C., Torres L.G. 2013. Surfactant enhanced washing of soil contaminated with petroleum hydrocarbons and treatment of produced wastewaters using a biofilter. **Journal of Environmental Treatment Techniques** 1(2), 110-116.
  23. Luna-Reyes L.F., Duran-Encalada J.A., Bandala E.R. 2013. Exploring alternatives for sustainable development in Tamiahua wetlands. **Journal of Entrepreneurship, Management and Innovation** 9(2), 1-13.
  24. Castillo-Ledezma J.H., Pelaez M.A., Sanchez-Salas J.L., Dionysiou D.D., Bandala E.R. 2013. Solar water disinfection using NF-TiO<sub>2</sub>: Estimation of scaling-up parameters. **International Journal of Chemical Reactor Engineering** 11 (2), 1-8.
  25. Cuahtecotzi-Delint R., Mendez-Rojas M.A., Bandala E.R., Quiroz M.A. Recillas S., Sánchez-Salas J.L. 2013. Enhanced antibacterial activity of CeO<sub>2</sub> nanoparticles by surfactants. **International Journal of Chemical Reactor Engineering** 11(2), 1-5.
  26. Zacarias-Salinas M., Vaca M., Flores M.A., Bandala E.R., Torres L.G. 2013. Surfactant-enhanced washing of soils contaminated with wasted-automotive oils and the quality of the produced wastewater. **Journal of Environmental Protection** 4, 1495-1501.
  27. Bandala E.R., Cossio H., Sanchez-Lopez A., Cordova F., Peralta-Hernandez J., Torres L. 2013. Scaling up parameters for site restoration process using surfactant-enhanced-soil-washing coupled with wastewater treatment by Fenton and Fenton-like processes. **Environmental Technology** 34(3), 363-371.
  28. Bandala E.R., Torres L.G. 2012. Remediation of soils and aquifers in tropical and subtropical regions. **Physics and Chemistry of the Earth** 37-39, 1.
  29. Campos-Diaz K., Bandala E.R., Limas R. 2012. Fluid bed porosity

- mathematical model for an inverse fluidized bed bioreactor with particles growing biofilm. **Journal of Environmental Management** 104, 62-66.
30. Kelly-Vargas K., Cerro-Lopez M., Reyna-Tellez S., Bandala E.R., Sanchez-Salas J.L. 2012. Biosorption of heavy metals in polluted water, using different waste fruit cortex. **Physics and Chemistry of the Earth** 37-39, 26-29.
  31. Bandala E.R., Gonzalez L., Sanchez-Salas J.L., Castillo-Ledezma J.H. 2012. Inactivation of *Ascaris* eggs in water using sequential solar driven photo-Fenton and free chlorine. **Journal of Water and Health** 10(1), 20-30.
  32. Bandala E.R., Gonzalez L., De la Hoz F., Pelaez M., Dionysiou D.D., Dunlop P.S.M., Byrne J.A., Sanchez J.L. 2011. Application of azo dyes as dosimetric indicators for enhanced photocatalytic solar disinfection (ENPOSODIS). **Journal of Photochemistry and Photobiology A: Chemistry** 218, 185-191
  33. Castillo-Ledezma J. H., Sánchez-Salas J.L., López-Malo A., Bandala E.R. 2011. Effect of pH, solar irradiation and semiconductor concentration on the photocatalytic disinfection of *Escherichia coli* in water using Nitrogen-doped TiO<sub>2</sub>. **European Food Research and Technology** 233, 825-834.
  34. Bandala E.R., Perez R., Velez-Lee A.E., Sanchez-Salas J.L., Quiroz M.A., Mendez-Rojas M.A. 2011. *Bacillus subtilis* spore inactivation in water using photo-assisted Fenton reactions. **Sustainable Environmental Research** 21(5), 285-290.
  35. Bandala E.R., Castillo-Ledezma J.H., González L., Sánchez-Salas J.L. 2011. Solar driven advanced oxidation processes for inactivation of pathogenic microorganisms in water. **Recent Research Developments in Photochemistry and Photobiology** 8, 1-16.
  36. Reyna S., Sánchez J.L., Bandala E.R., Peralta-Hernández J.M., Quiroz M.A. 2011. Comparative analysis between the biological and electrochemical methods for the removal of 4-nitrophenol from aqueous media. **Sustainable Environmental Research** 21(5), 321-328.
  37. Villanueva-Rodríguez M., Bandala E.R., Quiroz M.A., Guzmán-Mar J.L., Peralta-Hernández J.M., Hernández-Ramírez A. 2011. Azo-dyes degradation by electrogenerated ferrate ion using BDD electrodes. **Sustainable Environmental Research** 21(5), 337-340.
  38. Vazquez B., Bandala E.R., Reyes R., Torres L.G. 2010. Variation of mechanical and hydraulic properties of soils contaminated due to a surfactant-enhanced washing process. **Soil and Sediment Contamination** 19, 1-16.
  39. Bandala E.R., Aguiar F., Torres L.G. 2010. Surfactant-enhanced soil washing for the remediation of sites contaminated with pesticides. **Land Contamination and Reclamation** 18(2), 151-159.
  40. Torres L.G., Hernandez M.A., Pica Y., Albiter V., Bandala E.R. 2010. Degradation of di-, tri-, tetra- and pentachlorophenol mixtures in an aerobic biofilter. **African Journal of Biotechnology** 9(23), 3396-3403.
  41. Sanchez-Salas J.L., Castillo J., Bandala E.R. 2009. Solar photocatalytic disinfection of water contaminated with *Escherichia coli* using nitrogen-doped titanium dioxide. **Italian Journal of Tropical Medicine** 14(1-4), 21-27.
  42. Torres L.G., Belloc C., Vaca M., Iturbe R., Bandala E.R. 2009. Coagulation-flocculation processes applied to wastewater generated in hydrocarbon-

- contaminated soil washing: interactions among coagulant and flocculant concentration and pH value. **Journal of Environmental Science and Health A: Toxic/Hazardous Substances and Environmental Engineering** 44(13), 1449-1456.
43. Villanueva M., Hernández A., Peralta J.M., Bandala E.R., Quiroz M.A. 2009. Enhancing the electrochemical oxidation of acido-yellow 36 azo dyes using boron-doped diamond electrodes by addition of ferrous ion. **Journal of Hazardous Materials** 167, 1226-1230.
  44. Bandala E.R., Miranda J., Beltran M., Vaca M., Lopez R., Torres L.G. 2009. Wastewater disinfection and organic matter removal using ferrate (VI) oxidation. **Journal of Water and Health** 7(3), 507-513.
  45. Bandala E.R., Brito L., Pelaez M.A. 2009. Degradation of domoic acid toxin by UV promoted Fenton-like process. **Desalination** 245, 135-145.
  46. Bandala E.R., Corona-Vasquez B., Guisar R., Uscanga M. 2009. Deactivation of highly resistant microorganisms in water using solar driven photocatalytic processes. **International Journal of Chemical Reactor Engineering** 7 (A7), 1-16.
  47. Wong F., Alegria H., Bidleman T. Alvarado V., Angeles F. Avila-Galarza A., Bandala E.R., Galindo-Estrada I., Galindo-Reyes G., Gold-Bouchot G. Macías-Zamora J., Murguía-González J., Ramírez-Espinoza E. 2009. Passive air sampling of organochlorine pesticides in Mexico. **Environmental Science and Technology** 43, 704-710.
  48. Villanueva M., Hernandez A., Peralta-Hernández J.M., Bandala E.R., Quiroz M.A. 2008. *In-situ* generation of ferrate ion [Fe(VI)] in acidic conditions: A potential wastewater decontamination process. **ECS Transactions** 15(1), 411-416.
  49. Bandala E.R., Velasco Y., Torres L.G. 2008. Decontamination of soil washing wastewater using solar driven advanced oxidation processes. **Journal of Hazardous Materials** 160, 402-407.
  50. Orozco S.L., Bandala E.R., Arancibia-Bulnes C.A., Serrano B., Suárez-Parra R. 2008. Effect of iron salt on the color removal of water containing the azo-dye reactive blue 69 using photo assisted Fe(II)/H<sub>2</sub>O<sub>2</sub> and Fe(III)/H<sub>2</sub>O<sub>2</sub> systems. **Journal of Photochemistry and Photobiology A: Chemistry** 198, 144-149.
  51. Bandala E.R., Peláez M.A., Salgado M.J., Torres L.G. 2008. Decontamination of sodium dodecyl sulfonate using solar driven Fenton like Advanced Oxidation Processes. **Journal of Hazardous Materials** 151, 578-584.
  52. Bandala E.R., Peláez M.A., García-López A.J., Salgado M.J., Moeller G. 2008. Photocatalytic decolourization of synthetic and real textile wastewater containing benzidine-based azo dyes. **Chemical Engineering and Processing** 47, 169-176.
  53. Guisar R., Herrera M.I., Bandala E.R., García J., Corona B. 2007. Inactivation of waterborne pathogens using solar photocatalysis. **Journal of Advanced Oxidation Technologies** 10(2), 435-438.
  54. Bandala E.R., Pelaez M.A., García J.A., Dionysiou D.D., Gelover S., Macías D. 2007. Degradation of 2,4-dichlorophenoxyacetic acid (2,4-D) using cobalt-peroximonosulfate in Fenton-like process. **Journal of Photochemistry and**

**Photobiology A: Chemistry** 186, 357-363.

55. Bandala E.R., Estrada C. 2007. Comparison of solar collection geometries for application to photocatalytic degradation of organic contaminants. **Solar Energy Engineering** 129, 22-26.
56. Torres L.G., Climent M., Bandala E.R., Urquiza G., Iturbe R. 2007. Characterization and treatability of a contaminated soil from an oil exploration zone. **International Journal of Environmental Science and Technology** 4(3), 311-322
57. Bandala E.R., Domínguez Z., Rivas F., Gelover S. 2007. Degradation of atrazine using solar driven Fenton-like advanced oxidation processes. **Journal of Environmental Science and Health, Part B: Pesticides, Food Contaminants, and Agricultural Waste** 42(1) 21-26.
58. E.R. Bandala, Octaviano J.A., Pastrana P., Torres L.G. 2006. Removal of aldrin, dieldrin, heptachlor and heptachlor epoxide using activated carbon and/or *Pseudomonas fluorescens* free cell cultures. **Journal of Environmental Science and Health. Part B: Pesticides, Food Contaminants and Agricultural Wastes** 41(5), 553-570.
59. Chacón J.M., Leal M.T., Bandala E.R., Sánchez M. 2006. Solar photocatalytic degradation of azo-dyes by photo-Fenton process. **Dyes and Pigments** 69, 144-150.
60. Tamari S., Samaniego D., Bonola I., Bandala E.R., Ordaz V. 2005. Particle density of volcanic scoria determined by water pycnometry. **Geotechnical Testing Journal** 28(4), 1-7.
61. Santacruz G., Bandala E.R., Torres L.G. 2005. Chlorinated pesticides (2,4-D and DDT) biodegradation at high concentrations using immobilized *Pseudomonas fluorescens*. **Journal of Environmental Science and Health B: Pesticides, Food Contaminants and Agricultural Wastes** 40(4);571-583.
62. Bandala E.R., Martínez D., Martínez E., Dionysiou D.D. 2004. Degradation of microcystin-LR toxin by Fenton and Photo-Fenton process. **Toxicon** 43 (1), 829-832.
63. Bandala E.R., Arancibia C.A., Orozco S.L., Estrada C.A. 2004. Solar photoreactors comparison based on oxalic acid photocatalytic degradation. **Solar Energy** 77(5); 503-512.
64. Bandala E.R., Gelover S., Leal M.T., Arancibia C., Jiménez A., Estrada C.A. 2002. Solar photocatalytic degradation of Aldrin. **Catalysis Today** 76 (2-4); 189-199.
65. Arancibia C., Bandala E.R., Estrada C.A. 2002. Radiation absorption and rate constants for carbaryl photocatalytic degradation in a solar collector. **Catalysis Today** 76 (2-4); 149-159.
66. Gelover S., Bandala E.R., Leal M.T., Pérez S., Martínez E. 2000 GC-MS determinations of volatile organic compounds in drinking water supplies in Mexico. **Environmental Toxicology** 15, 131-139.
67. Gelover S., Leal T., Bandala E.R., Román A., Jiménez A., Estrada C. 2000. Catalytic photodegradation of alkyl surfactants. **Water Science and Technology** 42 (5-6), 110-116.
68. Leal M.T., Bandala E.R., Gelover S. 1999. THMs in drinking water in Mexico.

### ***In preparation***

Five manuscripts are currently in preparation

### ***Books***

69. Torres L.G., Bandala E.R. (Eds). 2014. **Energy and Environment Nowadays**. Nova Publishers (ISBN: 978-1-63117-399-8).
70. Torres L.G., Bandala E.R. (Eds). 2013. **Restoration of soil and aquifers in Mexico: Fundamentals and field experiences**. FUNDAp. Mexico. (ISBN: 978-607-513-036-1).
71. Torres L.G., Bandala E.R. (Eds.) 2009. **Remediation of Contaminated Soil and aquifers**. Nova Publishers Press. New York, USA. (ISBN: 978-1-60741-372-1)
72. Raynal J.A., Bandala E.R., Corona-Vasquez B. (Eds.). 2009. **Water, Environment and Climate Change**. Universidad of Las Américas-Puebla. Puebla, Mexico. (ISBN: 978-607-00-1307-2).

### ***Book Chapters***

73. Ramirez I.M., Mendez-Rojas M.A., Bandala E.R. 2016. Photocatalytic degradation of natural and synthetic estrogen with semiconducting nanoparticles. In: Hussain C.M., Kharisov B., Thompson M (Eds.) **Advanced Environmental Analysis: Applications of Nanomaterials**. Royal Society of Chemistry (ISBN 978-1782621447) (In press).
74. Ramirez I.M., Dolls S.C., Bandala E.R. 2015. Drinking water and sanitation in Central America: Challenges, Perspectives and Alternative Water Treatment. In: Ahuja S., de Andrade J.B., Dionysiou D.D., Hrisvtosky K.D., Loganathan B.G. (Eds.) **Water Challenges and Solutions on a Global Scale** (ISBN 9780841231061).
75. Martinez P.F., Bandala E.R. 2015. Issues and challenges for water supply, stormwater drainage and wastewater treatment in Mexico City. In: Mahlkecht J., Keledin J., Aguilar I., Kjellen M. (Eds.) **Water and Cities in Latin America: Challenges for sustainable development** (ISBN 978-0-415-73097-6)
76. Bandala E.R., Bustos E. 2015. Photocatalytic materials in water disinfection. In: Hernández-Ramírez A., Medina-Ramírez I. (Eds.) **Photocatalytic semiconductors: Synthesis, characterization and Environmental Application**. Springer (ISBN 978-3-319-10998-5)
77. Bandala E.R., Quiroz M.A., Cerro-López M., Méndez-Rojas M.A. 2014. Nanostructured metal oxides for wastewater disinfection. In: Kharisov B.I., Kharissova O.V., Rasika-Dias H.V. (Eds.) **Nanomaterials for**



- Environmental Applications.** John Wiley & Sons (ISBN: 978-1-118-49697-8).
78. Bandala E.R., Torres L.G. 2013. Hydrocarbon contaminated soil washing wastewater treatment using advanced oxidation processes. In: Torres L.G., Bandala E.R. (Eds.) ***Restoration of soil and aquifers in Mexico: Fundamentals and field experiences.*** FUNDAp Mexico (ISBN: 978-607-513-036-1).
  79. Bandala E.R., Raichle B. 2013. Solar driven advanced oxidation processes for water decontamination and disinfection. In: Enteria N., Akbarzadeh A. (Eds.) ***Solar Energy Sciences and Engineering Applications.*** CRC Press (ISBN: 9781138000131).
  80. Corona-Vasquez B., Auriolles V., Bandala E.R. 2012. Solar drinking water generation by solar-driven Fenton-like processes. In: E.B. Babatunde (Ed.) ***Solar Radiation.*** InTech Press (ISBN: 978-953-51-0384-4).
  81. Quiroz M.A., Bandala E.R. 2011. Types of conducting diamond materials and their properties. In: E. Brillas, M.A. Martínez-Huitle (Eds.) ***Synthetic diamond films: Preparation, Electrochemistry, Characterization and Applications.*** John Wiley & Sons (DOI: 10.1002/9781118062364.ch3).
  82. Quiroz M.A., Bandala E.R., Martínez-Huitle C. 2011. Advanced oxidation processes (AOPs) for removal of pesticides from aqueous media. In: M. Stoycheva (Ed.) ***Pesticides- Formulations, effects, fate.*** InTech Press (ISBN 978-953-307-532-7)
  83. Torres L.G., Bandala E.R. 2009. Integrated surfactant enhanced soil washing and physicochemical/biological treatment of produced waters. In: R.V. Steinberg (Ed.) ***Contaminated soils: Environmental impact, disposal and treatment.*** Nova Science Publishers. New York.
  84. Bandala E.R., Torres L.G. 2009. Soil washing wastewater treatment using advanced oxidation processes. In: Torres L.G., Bandala E.R. (Eds.) ***Remediation of Soils and Aquifers.*** Nova Publishers Press. New York, USA.
  85. Torres L.G., Bandala E.R. 2009. Soil washing for remediation of soil contaminated with petroleum hydrocarbon and/or metals. In: Torres L.G., Bandala E.R. (Eds.) ***Remediation of Soils and Aquifers.*** Nova Publishers Press. New York, USA.
  86. Armas R., Corona-Vasquez B., Bandala E.R. 2009. Estimation of the trophic state at Tamiahua lagoon, Veracruz, Mexico. In: Raynal J.A., Bandala E.R., Corona-Vasquez B. (Eds.). 2009. ***Water, Environment and Climate Change.*** Universidad of Las Américas-Puebla. Puebla, Mexico.
  87. Bandala E.R., Torres L.G. 2008. Pesticide removal from water using advanced oxidation technologies: Challenges and Perspectives. In: A.B. Teneffy (Ed.) ***Pesticide research trends.*** Nova Publishers Press. New York, USA.
  88. Blanco, J., S. Malato, C. Estrada, E. R. Bandala, S. Gelover y T. Leal. 2004. Water detoxification by heterogeneous photocatalysis: State-of-the-art. In M.A. Blesa and B. Sánchez (Eds.) ***Pollutants Elimination by***

- Heterogeneous Photocatalysis.** Editorial CIEMAT. Madrid, Spain.
89. Malato S., J. Blanco, C. Estrada, E.R. Bandala. 2004. Pesticide degradation using solar photocatalysis. In M.A. Blesa and B. Sanchez (Eds.) **Pollutants Elimination by Heterogeneous Photocatalysis**. Editorial CIEMAT. Madrid, Spain.
90. M.T. Leal, S. Gelover, M. Millán, E.R. Bandala. 2002. México. In: M.I. Litter (Ed.) **Community analysis for the application of low cost potabilization technologies**. Digital Grafic. La Plata, Argentina.
91. Torres L.G., Santacruz G., Bandala E.R. 1999. Biodegradation of 2,4-D and DDT degradation at high concentrations in low-cost packaging biofilters. In: Alleman B.C., Leeson A. (Eds.) **Bioremediation of nitroaromatic and haloaromatic compounds**. pp 137-141. Battelle Press. Columbus Ohio, USA.
92. Bandala E.R., Octaviano J.A., Albiter V., Torres L.G. 1998. Degradation of pesticides by free *Pseudomonas fluorescens* cell cultures. In: Wickramanayake G.B., Hinchee R.E. (Eds.) **Designing and Applying Treatment Technologies. Remediation of chlorinated and recalcitrant compounds**. pp 177-182. Batelle Press. Columbus, Ohio, USA.
93. Torres L.G., Salinas A., Bandala E.R., Jimenez B. 1998. Removal of di, tri, tetra and pentachlorophenol mixtures in a 5 L continuous packed column. In: Wickramanayake G.B., Hinchee R.E. (Eds.) **Bioremediation and Phytoremediation. Chlorinated and Recalcitrant Compounds**. pp 7-12. Batelle Press. Columbus, Ohio, USA.

### **Conference proceedings**

94. Molina J., Zuñiga C., Gutierrez E., Mendoza E., Sanchez-Salas J.L., Bandala E.R. 2013. Carrier photo-generation during UV-Vis irradiation on horizontal and vertical metal-semiconductor structures based on rutile-phase TiO<sub>2</sub> nanoparticles. SENSORDEVICES 2013: The Fourth International Conference on Sensor Device Technologies and Applications.
95. Bandala E.R., Durán J., Holland J.N. 2011. Effects of water quality resulting from global climate change on community development in the US-Mexico border region. Written under contract for the **Second Annual The Puentes Consortium of the Mexico-U.S. Higher Education Leadership Forum**. March 2011 Conference hosted by the James A. Baker III Institute of Public Policy, Rice University.
96. Bandala E.R., Holland J.N. 2010. Mexico-U.S. border and the environment: Implications for bi-national water relations. Written under contract for the **First Annual The Puentes Consortium of the Mexico-U.S. Higher Education Leadership Forum**. March 2010 Conference hosted by the James A. Baker III Institute of Public Policy, Rice University.
97. De la Hoz F., Bandala E.R. Arumi J.L., Rivera D. 2010. Photocatalytic disinfection of water using photocatalyzer immobilized in mortar and solar radiation. Proceedings of the 21<sup>st</sup> Century Watershed Technology: Improving Water Quality and Environment Conference. February 21-24, 2010. Costa

Rica.

98. Armas R., Corona-Vasquez B., Bandala E.R. 2009. Estimation of the trophic state at Tamiahua lagoon, Veracruz, Mexico. In: Raynal J.A., Corona-Vasquez B., Bandala E.R. (Eds.) **Water, Environment and Climate Change. Proceedings of the International Conference on Water, Environment and Health Sciences: The Climate Change Challenges (ICWEHS)**, April 13-19, 2009. Cholula, Puebla, Mexico.
99. Torres L.G., Belloc C., Iturbe R., Bandala E.R. 2008. Coagulation-flocculation processes applied to wastewaters generated in hydrocarbon-contaminated soil washing. **Proceedings of the 3<sup>rd</sup> International Meeting on Environmental Biotechnology and Engineering (3IMEBE)**. Palma de Mallorca, Spain. September 21-25, 2008.
100. García J.L., Mejía L., Bandala E.R., Corona-Vasquez B. 2007. Helminth eggs inactivation by homogeneous photocatalysis. **Proceedings of the XII International Congress in Environmental Sciences**. Chihuahua, Mexico June 6-8, 2007.
101. Chacón J.M., M.T. Leal, M. Sánchez, Bandala E.R. 2005. Solar driven photocatalytic degradation of the azo-dye acid orange 24 by photo-Fenton process. **Proceedings of the ISES 2005 Conference**, August 8-12, 2005. Florida, USA.
102. Bandala E.R., R.C. Moreno, E. Juárez, P. Girard, D.D. Dionysiou. 2005. Solar driven disinfection of water using low radiative solar collector and a novel immobilized TiO<sub>2</sub> catalyst. **Proceedings of the ISES 2005 Conference**, August 8-12 2005. Florida, USA.
103. Chacón J.M., M.T. Leal, E.R. Bandala, M. Sánchez. 2004. Dye mineralization using solar driven photo-Fenton process. **Proceedings of the XXIX AIDIS Conference 2004**. August 22-27 2004. Puerto Rico.
104. Bandala E.R., S.L. Orozco, C.A. Arancibia, C. A. Estrada. 2004. Solar photoreactors comparison based on oxalic acid photocatalytic degradation. **Proceedings of the 12<sup>th</sup> International SolarPACES Symposium**. October 6-8, 2004. Oaxaca, Oax. México.
105. Bandala E.R., C.A. Arancibia, C. Estrada. 2003. Photocatalytic degradation of oxalic acid using different solar collector geometries. **Proceedings of the ISES-SolarPACES Conference**. October 6-8, 2004. Oaxaca, Oax. México.
106. Portilla, D., E.R. Bandala, Ramírez V. 2002. PAHs biodegradation with *Mycobacterium* sp PYR-1. **Proceedings of the 28<sup>th</sup> AIDIS Congress**.
107. Chacón J.M., M.T. Leal, E.R. Bandala. 2002. Photocatalytic water treatment processes: Determination of scaling-up parameters. **Proceedings of the XVII National Congress in Hydraulics**.
108. Chacón J. M., M. Sánchez, M.T. Leal, E. R. Bandala. 2002. Textile wastewater treatment using solar photocatalysis. **Proceedings of the 28<sup>th</sup> Congress of AIDIS**.
109. Pérez-Estrada L.A., M. Sánchez, M.T. Leal, E.R. Bandala. 2002. Laboratory wastes treatment using solar photocatalysis. **Proceedings of the 28<sup>th</sup> Congress of AIDIS**.
110. González-Herrera A., J. Vergara, A. Martín, E.R. Bandala, C.A. Estrada. 2002. Solar water disinfection using a flat plate solar collector. **Proceedings**

**of the 28<sup>th</sup> Congress of AIDIS.**

111. Arancibia-Bulnes C. A., E. R. Bandala, C.A. Estrada. 2002. Radiation absorption in parabolic trough and CPC solar photocatalytic reactors. **Proceedings of the 11<sup>th</sup> Solar PACES International Symposium on Concentrated Solar Power and Chemical Energy Technologies** 445-451. September 4-6, 2002. Zurich, Switzerland.
112. Bandala E. R., A. Paredes , I. Gómez , S. Gelover , M.T. Leal , C. A. Estrada , C. A. Arancibia. 2002. Solar photocatalytic degradation of two pesticides in two solar collectors. **Proceedings of the 11<sup>th</sup> Solar PACES International Symposium on Concentrated Solar Power and Chemical Energy Technologies** 473-478. September 4-6, 2002. Zurich, Switzerland.
113. Sanchez M., Bandala E.R., Leal M.T., Estrada C. 2001. Kinetic comparative studio on the radiation absorption in different solar collector geometries. **Proceeding of the National Solar Energy Conference**. Mexico City. October, 2001.
114. Galindo R. Bandala E.R., Gelover S., Leal T., Estrada C. 2000. Pesticide adsorption in titanium dioxide. **Proceedings of the Millenium Solar Forum** 2000. Mexico City. September, 2000.
115. Paredes A., Gomez I., Leal T., Gelover S., Bandala E.R., Estrada C. 2000. Application of non-concentrated solar radiation for the photocatalytic degradation of pesticides. **Proceedings of the Millenium Solar Forum** 2000. Mexico City. September, 2000.
116. Bandala E.R., Torres L.G. 1999. Toxicity reduction of cholorophenols mixtures in an aerobic biofilter. **Proceedings of the Conference on Waste Minimisation and End of Pipe Treatment in Chemical and Petrochemical Industries** 371-376. Yucatán, México. August, 1999.
117. Gelover S., Leal T., Bandala E.R., Roman A., Jimenez A., Estrada C. 1999. Catalytic photodegradation of alkyl surfactants. **Proceedings of the Conference on Waste Minimisation and End of Pipe Treatment in Chemical and Petrochemical Industries** 305-312. Yucatán, México. August, 1999.
118. Torres L.G., Salinas A., Jimenez B., Bandala E.R. 1999. Start-up and operation of an aerobic biofilter for the treatment of synthetic wastewaters containing chlorophenols and their mixtures. **Proceedings of the Conference on Waste Minimisation and End of Pipe Treatment in Chemical and Petrochemical Industries** 577-580. Yucatán, México. August, 1999.

***Consultancy projects***

119. Wastewater treatment and re-use in Clariant Mexico. Clariant International Ltd. Mexico.
120. Design and supervision of the waste water plant, TermoEsmeraldas. Ecuador.
121. Design and construction of an experimental prototype for water detox and disinfection in rural, isolated zones by advanced oxidation processes (DARA-

- PAO). Consultant project report grant G-28550443. Universidad de las Américas, Puebla. Mexico.
122. Water quality in reservoirs of the Lerma-Chapala basin, Mexico. Research project report grants TC-0587 and TH-0517. Ministry of Environment. Mexico.
  123. Water effluent characterization and treatment in Pajaritos petrochemical complex, Mexico. Consultant project report grant B-1511208. PEMEX S.A. Mexico.
  124. Study of pre-treatability of wastewater from petrochemical complexes in south-east Mexico. Consultant project report grant TC-0227. PEMEX S.A. Mexico.
  125. Underground water quality evaluation in northern-central basins, Mexico. Consultant project report grants TC-0257. Ministry of Environment. Mexico.
  126. Organochloride compounds spreading from Pajaritos petrochemical complex wastewater. PEMEX S.A., Mexico.
  127. Water quality in the Suchiate river, Mexico. Consultant project report grant 4050/01-GRFS-CA-1. Ministry of Environment. Mexico.
  128. Water quality in the Ensenada bay, Mexico. Consultant project report grant CAN/SGT-IMTA-2000. Ministry of Environment. Mexico.
  129. Application of photocatalysis for the treatment of wastewater using solar radiation. Consultant project report grant 400373-5-28091T. Ministry of Environment. Mexico.
  130. Water quality in Acapulco bay, Mexico. Consultant project report grants TC-9917. Ministry of Environment. Mexico.

### ***Presentations and invited lectures***

131. Keynote. Environmental Restoration Using Nano-sized Materials for Application in Advanced Oxidation Processes. Invited Lecture at the Environmental Engineering and Earth Sciences Department, Clemson University. Clemson, SC.
132. Keynote. Using Solar Energy for Water Quality Enhancement: An Interdisciplinary Point of View. Invited Lecture at the Sustainable Technology and Design Environmental Studies Program, Department of Physics and Astronomy. Colgate University. Hamilton, NY.
133. Keynote. Mexico-US Border and the Environment: Implications for binational water relations. Invited Lecture at the Higher Education Leadership Forum US-Mexico Border Security- A Binational Perspective. Rice University, Houston Texas. Jan 13-14, 2010.
134. Keynote. Alternative Energies Perspectives in Mexico. Invited Lecture presented at the North American Energy Roundtable. University of Nevada at Las Vegas. Las Vegas, March 27, 2009.
135. Plenary. Water treatment using advanced oxidation processes. Invited seminar presentation at the Department of Civil Agricultural Engineering. Universidad de Concepción, Chile. May, 2008.
136. Keynote. Advanced methods for water disinfection. Invited podium presentation at the Department of Civil Agricultural Engineering. Universidad

- de Concepción, Chile. May, 2008.
137. Plenary. Pathogens deactivation in water using oxidation processes. Invited podium presentation at the Department of Chemistry. Universidad Autónoma de Nuevo León, México. April, 2008.
  138. Plenary. Advanced oxidation processes for water disinfection and decontamination. Invited podium presentation at the International Symposium Mexico-Canada on Advanced Technologies for Drinking water and wastewater Treatment. Instituto Tecnológico de Celaya, México. March, 2007.
  139. Plenary. Water quality for irrigation: fundamentals and pollution mitigation. Invited seminar presentation at the Department of Civil Agricultural Engineering. Universidad de Concepción, Chile. September, 2004.
  140. Keynote. Application of solar driven advanced oxidation processes for pesticide degradation in water. Scaling-up of the process. Invited podium presentation at the Department of Chemistry. Universidad de Las Américas-Puebla, Mexico. February, 2005.
  141. Keynote. Advanced oxidation processes. Invited podium presentation at the Department of Civil and Agricultural Engineering. Universidad de Concepción, Chile. September, 2004.
  142. Water decontamination using solar energy. Invited podium presentation at the Department of Chemistry. Universidad de Las Américas-Puebla, Mexico. February, 2004.
  143. Water disinfection using photocatalysis, experiences in Mexico. Invited podium presentation at the Peruvian Institute of Nuclear Energy, Peru. November, 2003.
  144. Environmental technology: Water quality and treatment. Invited podium presentation at the International Forum on Ecology and Sustainable Development. Xalapa, Mexico. September, 2002.

## **Current and previous research grants**

### ***International Funded Projects***

1. Appropriate Technology and Climate Change Adaptation for Water Resources Management. Funded by the British Council (UK). £ 21,100.00 January, 2015 (In collaboration with Morgan Adams, Robert Gordon University, UK).
2. Prototype design and building of an experimental prototype for water disinfection and detox in isolated rural areas using Advanced Oxidation Processes (DARA-PAO). Funded by the MAPFRE Foundation (Spain). €15,000.00 January-December 2010.
3. Renewable energy, energy efficiency and competitiveness: A Partnership between Appalachian State University and Universidad de Las Américas Puebla. Funded by the Higher Education Department (US-HED). USD \$300,000.00. October 2009-September 2012 (In collaboration with Jesse Lutabingwa, App State University, USA).

4. Water disinfection and detoxification in isolated rural areas using advanced oxidation processes (DARA-PAO). Founded by the Spanish Agency for International Cooperation (AECID), USD \$36,000.00. January-December 2009 (In collaboration with C. Dopazo, Universidad de Zaragoza, Spain).
5. Enhanced photocatalytic solar disinfection of water. Funded by the US Environmental Protection Agency (USEPA) P3 Program Grant, USA. USD\$10,000. September 2008-August-2009. (In collaboration with D.D. Dionysiou, University of Cincinnati, USA).
6. Detoxification of water from soil washing systems using Advanced Oxidation Processes. Funded by the National Science Foundation, USA. USD \$96,000.00. (In collaboration with D.D. Dionysiou, University of Cincinnati, USA). June 2005-July 2007.
7. Hydroxyl Radical and Sulfate Radical-Based Advanced Oxidation Nanotechnologies for the Destruction of Biological Toxins in Water. Founded by Ohio Board of Regents, USD \$62,262, July 2005-June, 2006. (In collaboration with D.D. Dionysiou, University of Cincinnati, USA).

### ***National Funded Projects***

8. Identification of oxidation by-products generated after the application of Advanced Oxidation Processes for the degradation of red tide-toxins in water. Funded by the National Council of Science and Technology, Mexico. USD\$ 110,000. January 2012-December 2015.
9. Design of coupled sequential conventional-non conventional wastewater treatment system for effluent decontamination in Veracruz, Mexico. Funded by the National Council of Science and Technology, Mexico. USD\$ 200,000. July 2010-February 2013.
10. Water quality vulnerability to climate change in selected basins from Mexico. Funded by the Ministry of Environment-Mexico. USD\$ 20,000.00. January-December 2010.
11. Soil washing wastewater decontamination using advanced oxidation processes coupled with biological treatment. Funded by the National Council of Science and Technology, Mexico. USD\$ 201,000. September 2008-August 2010. (In collaboration with L.G. Torres, UPIBI-IPN).
12. Solar photocatalytic disinfection of water as effective alternative in the prevention of waterborne illnesses in rural marginal zones of Mexico. Funded by the National Council of Science and Technology, Mexico. USD\$ 10,000. October 2008-September 2009.
13. Water Quality in Zahuapan River, Mexico. Funded by the National Council of Science and Technology, Mexico. USD\$ 35,000. January 2006-February 2007. (In collaboration with V. Ramírez, IMTA).
14. Integral Plan for Tamiahua Lagoon, Tamiahua, Mexico. Funded by The National Council of Science and Technology, Mexico USD\$ 150,000. January 2007-December 2008. (In collaboration with B. Corona, University of Las Américas-Puebla).
15. Water Quality in Reservoirs from the Lerma-Chapala Basin, México. Funded

- by the Ministry of Environment, Mexico (SEMARNAT). USD \$80,000.00. March-December, 2005.
16. Biopesticide Development for Aquatic Weed Control. Funded by the National Council of Science and Technology, Mexico. USD\$185'500.00. February 2003-February 2006. (In collaboration with M. Martínez, IMTA).
  17. Development of energy saving systems in disinfection processes using solar energy. Funded by the National Council of Science and Technology, Mexico. USD\$56,000.00. December 2005-November 2007.
  18. Detoxification of Wastewater from Textile Industry Using Solar Photocatalysis. Funded by the National Council of Science and Technology. USD\$30,000.00. January-December 2006.
  19. Detoxification of Pesticide Contaminated Water Using Solar Photocatalysis. Funded by the National Council of Science and Technology. USD\$100,000.00. May 2005-April 2007. (In collaboration with S. Gelover, IMTA).
  20. Application of Sequential Disinfection Processes to Helminth Eggs. Funded by the National Council of Science and Technology. USD\$56,000.00. September 2005-October 2008. (In collaboration with B. Corona, Universidad de Las Américas-Puebla).
  21. Toxicological Evaluation of Tampico-Madero Beaches, Mexico. Funded by the National Council of Science and Technology. USD\$150,000.00. September 2005-August 2007. (In collaboration with Y. Pica, IMTA).

<b>Total Research Funds Received Individually (1/2005-to date):</b>	<b>USD\$ 630,500.00</b>
<b>Total Research Funds Receive In Collaboration (1/2005-to date):</b>	<b>USD\$ 1'339,726.00</b>
<b>Total Research Funds Received (2005-to date):</b>	<b>USD\$ 1'970,226.00</b>

**Graduate students advised**

**Current students**

***Posdoc Students***

Teresa Palacios, PhD

***PhD Students***

Irving Ramírez. Universidad de Las Américas, Puebla.  
Laura Sol Pérez. Universidad de Las Américas, Puebla.

***Master's students***

Chase Edge. Appalachian State University, USA



Orlando Morales. Universidad de Las Américas, Puebla.  
Lucero Mirón. Benemerita Universidad Autónoma de Puebla.  
Miguel A. Pérez Escamirosa. Benemerita Universidad Autónoma de Puebla.  
Lorena Castillo Rodríguez. Universidad Autónoma del Estado de Morelos.

### ***Undergraduated students (research)***

Alex Prevatte. Appalachian State University  
D.J. Wallett. Applachian State University  
Roberto Perez. Universidad de Las Américas-Puebla.

### ***Former students***

### ***PhD Students***

Veronica Auriolos López. Universidad de Las Américas, Puebla.  
Jordana Castillo Ledezma. Universidad de Las Américas, Puebla.

### ***Master's students***

Oscar Rodríguez. Universidad de Las Américas, Puebla.  
José Luis Alvarez. Instituto Politécnico Nacional.  
Laura Sol Pérez. Universidad de Las Américas, Puebla.  
Jordana H. Castillo. Universidad de Las Américas, Puebla.  
Roberto Moreno. Universidad Veracruzana  
Manuel Sanchez. Universidad Nacional Autónoma de México  
Leónidas Pérez. Universidad Autónoma de Sonora

### ***Undergraduated students***

Kim Noel. Applachian State University. USA  
Matt Freer. Appalachian State University. USA  
Carlos Burgueño. Universidad de Las Américas-Puebla.  
Alba Bueno. Universidad de Las Américas, Puebla.  
Margarita Maldonado. Universidad de Las Américas, Puebla.  
Bernardo Tiro. Universidad de Las Américas, Puebla.  
Mariana Luján. Universidad de Las Américas, Puebla.  
Armando Castañeda. Universidad de Las Américas-Puebla.  
Gerardo Martínez. Universidad de Las Américas-Puebla.  
Fernando Aguilar. Universidad de Las Américas-Puebla.  
Victor Mastache. Universidad de Las Américas-Puebla.  
José Luis Sánchez. Universidad de Las Américas-Puebla.  
Francisco Camargo. Universidad de Las Américas-Puebla.  
Horacio Cossio. Universidad de Las Américas-Puebla.  
Liliana Gonzalez. Universidad Autónoma del Estado de Morelos  
Bernardo Vazquez. Universidad de Las Américas-Puebla  
Manuel Figueroa. Universidad de Las Américas-Puebla

Miguel A. Pelaez. Universidad de Las Américas-Puebla  
 Fernanda Rivas. Universidad de Las Américas-Puebla  
 Guadalupe Segobia. Universidad Veracruzana  
 Jessica Manrique. Universidad Veracruzana  
 Sayra Orozco. Universidad Autónoma de Zacatecas  
 Martha Zárate. Universidad Autónoma del Estado de Morelos  
 Juan Andres Octaviano. Instituto Tecnológico de Zacatepec  
 Mirna Cabello. Universidad Autónoma del Estado de Morelos

## **Editorial activities**

### ***Editorial Board Member.***

Journal of Technology Innovations in Renewable Energy

ISRN Renewable Energy Journal (<http://www.hindawi.com/97179638/>)

### ***Gest Editor.***

Journal of Physics and Chemistry of the Earth. Appropriate Technology and Climate Change Adaptation for Water Resources Management special issue 2015.

International Journal of Chemical Reactor Engineering.

Journal of Physics and Chemistry of the Earth. Site Restoration special issue 2012.

Currently, I am involved as referee for the following international journals: Solar Energy Journal, Thin Film Solids, Solar Energy Engineering Journal, Journal of Hazardous Materials, Applied Catalysis, Chemical Engineering & Processing, Journal of Photochemistry and Photobiology A: Chemistry, Environmental Science and Technology, The Ecologist.

## **Summary of courses taught and developed (2010 to date)**

Number	Title	Hours/Week	Quarter/year
TEC-3606	Sustainable water and wastewater technology <sup>†</sup> <sup>✕</sup>	4.0	Fall, 2014
MDE-502	Thermal comfort and energy efficiency <sup>‡</sup>	4.0	Spring, 2014

LQ-131	Unitary operations	4.0	Spring, 2014
IQ-405	Environmental Analysis	4.0	Fall, 2013
IC-425	Introduction to Environmental Engineering <sup>‡</sup>	4.0	Fall, 2013
MDE-502	Thermal comfort and energy efficiency <sup>‡</sup>	4.0	Spring, 2013
LQ-131	Unitary operations	4.0	Spring, 2013
QC-231	Thermodynamics	4.0	Spring, 2013
IQ-405	Environmental Analysis	4.0	Fall, 2012
IC-425	Introduction to Environmental Engineering <sup>‡</sup>	4.0	Summer, 2012
MA-111	Basic Math	4.0	Fall, 2011
IC-425	Introduction to Environmental Engineering <sup>‡</sup>	4.0	Fall, 2011
IQ-589	Pollution Minimization	6.0	Summer, 2011
IC-560	Environmental Impact <sup>‡</sup>	3.0	Spring, 2011
MA-111	Basic Math	4.0	Spring, 2011
TEC-5628	Solar Thermal Technology <sup>**†‡</sup>	3.0	Fall, 2010
QC-231	Thermodynamics	3.0	Fall, 2010
IC-411	Water Treatment <sup>†‡</sup>	3.0	Fall, 2010
MA-111	Basic Math	4.0	Fall, 2010
CS-411	Math & Statistics	3.0	Spring, 2010
AE-305	Applied Statistics	4.0	Spring, 2010

\*Shared course with Prof. Benito Mariñas from University of Illinois at Urbana-Champaign.

\*\* Shared course with Prof. Brian Raichle from Appalachian State University.

† Courses in English; \* Course taught at Appalachian State University

z These courses were offered at the Civil Engineering program, Department of Civil and Environmental Engineering.