

# Table of Contents

## Preface, Committee and Sponsors

## Chapter 1: Biomass Processing

<b>Assessment of Selected Industrial Byproducts as Alternative Nutrient Source for <i>E. Coli</i> pET30a-HIV-RT</b> L.S.P. Bacal, R.C.R. Suplito, E.A.B. Macauyag, A.E. Gambe-Gilbuena and R.G. Abisado-Duque	3
<b>Combined Effects of Solid-to-Liquid Ratio and Ethanol Concentration on the Organosolv Delignification of Extractives-Free Bagasse</b> I.D.F. Tabañag, C.F.L. Go, N.S.L. Uy, L.C.C. Uy and L.K. Cabatingan	13
<b>The Effects of Acid Concentration, Temperature, and Time on the Acid Hydrolysis of Mango (<i>Mangifera Indica</i>) Seed Husk to Produce 5-HMF</b> I.D.F. Tabañag, J. Cruda, K.A.S. Lu and R.M.B. Sapa	31
<b>Effects of Catalyst Loading and Reaction Temperature on the Production of Hydroxymethylfurfural (HMF) from Brewers' Spent Grain (BSG) Hydrolysate</b> I.D.F. Tabañag, S.E.P. Lim, R.G.B. Mangubat and A.C.P. Son	57
<b>Kraft Pulping of Mango Seed Husk: Lignin Yield Optimization and Potential Resin Application</b> I.D.F. Tabañag, L.M.K.N. Camay, R.C. Pepito and C.R. Reguya	85

## Chapter 2: Bioceramics

<b>Development of an Anti-Bacterial Calcium Phosphate Bioceramic Orbital Implant Using Local Calcium Carbonate and Nano-Zinc Oxide</b> J.P. Reyes, S.R. Cayabyab-Gelilang, J.M.B. Sudayon, L.C. Milo, J.L.H. Laga, A.K.M. Collera, M.C.O. Que and M.T. Margarito	117
<b>Preliminary Biocompatibility Studies of Nano-Zinc Bioceramic Orbital Implant for Anophthalmic Socket Application</b> J.P. Reyes, S.R. Cayabyab-Gelilang, J.M.B. Sudayon, L.C. Milo, J.L. Laga, M.A. Ong and M.T. Margarito	123

## Chapter 3: Bio- and Blue Energy Technologies

<b>Esterification of Coconut Fatty Acid Distillate (COFAD) Using Hydrochloric Acid as Homogeneous Acid Catalyst: A Kinetic and Thermodynamic Analysis</b> I.D.F. Tabanag, J.M.N. Cabo, C.B.S. Legarde, S.A.L. Suico and J.S. Malila	131
<b>Heterogeneous Esterification of Coconut Oil Fatty Acid Distillates (COFAD) Using Directly Sulfonated Cacao Shells</b> I.D.F. Tabanag, J.L.O. Babanto, K.A.B. Catarig, J.A.S. Solatorio and J.S. Malila	155
<b>Utilization of Lignin from Waste Degumming Liquor as Fuel Additive and Binder in Sugarcane Bagasse Briquettes</b> I.D.F. Tabañag, L.J.L. Calotes, J.D.A. Dumalagan, J.Z.L. Merezido and L.K. Cabatingan	183
<b>Energetic and Economic Viability of Full-Scale Pressure Retarded Osmosis for Blue Power Generation in the Philippines</b> M.T. Isla-Cabaraban, I.V. Iligan, R. Albia, C. Maderal, J. Navarro and G.M.S. Cabaraban	209