

<b>Department</b>	School of Engineering and the Built Environment
<b>Supervisors</b>	Dr. Libu Manjakkal
<b>Project Title</b>	Development of 3D Printed Electrodes for Hybrid Supercapacitors
<p><b>PROJECT DESCRIPTION</b></p> <p>Hybrid Supercapacitors offeres multiple advantages in electrochemical energy storage especially for portable electronic gadgets and autonomous systems due to its high energy and power density. 3D printing and additive manufacturing have potential impacts in development of electrochemical energy storage devices. The porous electrode design using 3D printing will allow to achieve high electrochemically active area based electrodes development in hybrid supercapacitors. In this PhD project, the student will develop next generation of hybrid supercapacitors using 3D printing technology for energy autonomous systems. The electrodes will be developed in different sizes and shapes.</p> <p>The anticipated activities are</p> <ol style="list-style-type: none"> <li>1. Preparation of new 3D printable inks or pastes using composite materials</li> <li>2. Design and development of active electrodes via 3D printing</li> <li>3. Fabrication of hybrid supercapacitors and investigation of its energy storing performances</li> </ol> <p><b>Academic qualifications</b></p> <p>A first degree (at least a 2.1) ideally in electronics and mechanical engineering, physics, chemistry, and material science with a good fundamental knowledge of materials and solid works for 3D printing .</p> <p><b>English language requirement</b></p> <p>IELTS score must be at least 6.5 (with not less than 6.0 in each of the four components). Other, equivalent qualifications will be accepted. <a href="#">Full details of the University's policy</a> are available online.</p> <p><b>Essential attributes:</b></p> <ul style="list-style-type: none"> <li>• Experience of fundamental in materials, 3D printing and CAD design</li> <li>• Competent in collaborative research work</li> <li>• Knowledge of energy storage and 3D printing</li> <li>• Good written and oral communication skills</li> <li>• Strong motivation, with evidence of independent research skills relevant to the project</li> <li>• Good time management</li> </ul> <p><b>Desirable attributes:</b></p> <p>Modeling and simulation</p>	
<b>Enquiries</b>	For informal enquiries about this PhD project, please contact Dr.Libu Manjakkal : <a href="mailto:L.Manjakkal@napier.ac.uk">L.Manjakkal@napier.ac.uk</a>
<b>Web page</b>	<a href="https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process">https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process</a>