



Aditya College of Engineering & Technology

Aditya Nagar, ADB Road, Surampalem– 533437

Department of Mechanical Engineering

Academic Year: 2020-2021

Project Title:	Design and Analysis of OMNI Ball Spherical Wheel	
Guide Name:	Mr. A.Arif	
Students Name with Roll No.:	17P31A03B2	YEDUVAKA SATISHKUMAR
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Abstract	PO's Mapping	PSO's Mapping
Mechanical design of a novel spherical wheel shape for a omnidirectional mobile robot is presented. The wheel is used in a omnidirectional mobile robot realizing high step-climbing capability with its hemispherical wheel. Conventional Omniwheels can realize omnidirectional motion, however they have a poor step overcoming ability due to the sub-wheel small size. The proposed design solves this drawback by means of a 4 wheeled design. “Omni-Ball” is formed by two passive rotational hemispherical wheels and one active rotational axis. An actual prototype model has been developed to illustrate the concept and to perform preliminary motion experiments, through which the basic performance of the Omnidirectional vehicle with this proposed Omni-Ball mechanism was confirmed. An prototype has been developed to illustrate the concept. Motion experiments, with a test vehicle are also presented.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3

PO1: Engineering Knowledge	PO5: Modern Tool usage	PO9: Individual & Team Work
PO2: Problem Analysis	PO6: Engineer & Society	PO10: Communication Skills
PO3: Design & Development of solutions	PO7: Environment & Sustainability	PO11: Project Management & Finance
PO4: Investigations on complex problems	PO8: Ethics	PO12: Life Long Learning
PSO1: Mechanical Engineers must be able to analyze, design and evaluate mechanical components and systems using cutting-edge software tools as required by the industries from time to time.	PSO2: The ability to work in manufacturing and other sectors' operations and maintenance plants	PSO3: As part of a team or individually, plan and manage activities in micro, small, medium and large enterprises



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Relevance to PO's and PSO's

PO1	Applied the subject knowledge in calculation for design and systems
PO2	Studied and analysed existing designs of Omini ball
PO3	Structure of the frame is designed under simulation.
PO4	students will be able to find a feasible solution for the problem designed
PO5	Solid works and Ansys workbench tools are used for design and simulation.
PO6	Design and development of Omini ball
PO7	students will be able to finds solutions for environmental safety
PO8	students will be able to apply ethical principles and commit to professional ethics
PO9	Fabrication of the Omini ball is done by the team collaboration
PO10	students will be able to communicate their work in reviews and paper presentations
PO11	students will be able to manage the financial constraints
P012	students will be able to apply the analyzing skills in their professional career
PSO1	Students will be able to implement the application of software pertaining to the problem statement.
PSO2	Maintenance of the Omini ball is done.
PSO3	Entrepreneur skills attained

