National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

Programme	**Minor degree in Sports Engineering**	Year of Regulation	**2024**
Department	**Mechanical Engineering**	Semester	**III**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
ME 261	**Basics of Sports Engineering**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	Students will able to learn the basics of sports engineering and application of engineering in sports technology.	Course Outcomes	**CO1**	Able to understand the scopes and historical development of sports engineering
			CO2	Able to understand the basics of mechanics in sports along with the biomechanics of injury and injury prevention.
			CO3	Able to understand the details of sports equipment mechanics
			CO4	Able to understand various application of sports engineering.
			CO5	Able to understand the application of sports engineering

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
1	CO1	**3**	**2**	-	-	-	-	-	**2**	-	-	-	**2**	-	-
2	CO2	**3**	**2**	-	-	-	-	-	**2**	-	-	-	**2**	-	-
3	CO3	**3**	**2**	-	-	-	-	-	**2**	-	-	-	**2**	-	-
4	CO4	**3**	**2**	-	-	-	-	-	**2**	-	-	-	**2**	-	-
5	CO5	**3**	**2**	-	-	-	-	-	**2**	-	-	-	**2**	-	-
6	CO6	**0**	**0**	-	-	-	-	-	**0**	-	-	-	**0**	-	-

SYLLABUS

No.	Content	Hours	COs
I	Introduction to Sports Engineering: Definition and scope of sports engineering, Historical development of sports engineering, History of Physical Education and Sports Education, IOC, Role in sports industry, Sports Engineering and Entrepreneurship.	**04**	**CO1**
II	Mechanics in Sports: Introduction to mechanics and its application in sports, Importance of mechanics in understanding sports performance, Basics of biomechanics, Measurement of human movement in sports, Kinematics of Sports Movements, 3D analysis of the human body, Body segment parameters.	**07**	**CO2**
III	Basics of impacts and collisions in sports, tissue structure and mechanics; bone, muscles; Injuries to musculoskeletal tissues; Injuries to the upper limbs; Injuries to the lower limbs; Injuries to the ankle and foot; Injuries to the head and trunk; Protective equipment; Helmets, taping, shin guards etc.	**07**	**CO2**
IV	Sports Equipment Mechanics: Basics of sports equipment mechanics, Safety protocols in equipment repair, Testing and optimization of sports equipment	**05**	**CO3**
V	Materials Science in Sports: Atomic structure and interatomic bonding, Structure of crystalline solids, Material properties, Smart materials and their applications, Sports apparel technology.	**06**	**CO3**
VI	Sports Engineering Applications: Sports facilities, Design of infrastructure, Sports prosthetics and assistive devices, Environmental considerations.	**07**	**CO4**
	Total Hours	**36**	

Essential Readings

1. Ziegler, E.F. An introduction to Sports & Physical Education Philosophy. Delhi: Sp, 2007
2. Bucher, C.A., Foundation of Physical education (16ed.). New Delhi: Tata McGraw-Hill, 2010

Supplementary Readings

1. Bucher &Wuest, Foundations of Phy.Edu & Sports. Missouri: C.V.Mosby co., 1987
2. W. L. Kenney, Jack Wilmore, D. L. Costill. Physiology of Sport and Exercise, 6th Edition, Human Kinetics; 6th edition, 2015
3. Michael Yessis, Biomechanics and Kinesiology of Exercise, Ultimate Athlete Concepts, 2013