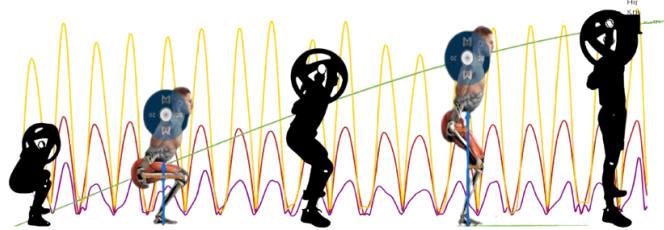


**REPORT OF
IMMERSION PROGRAMME ON
ADAPTED SPORTS AND SPORTS BIOMECHANICS
28 November -3 December 2022**



**Department of Sports Science and Yoga
Ramakrishna Mission Vivekananda Educational and
Research Institute
Belur Math, Dist.- Howrah, West Bengal-711202
(Rated A++ by NAAC in March 2019)**



**under the aegis of
UNESCO Chair in Inclusive Adapted Physical
Education and Yoga (ID 1004)**



**Department of Sports Science and Yoga
Ramakrishna Mission Vivekananda Educational and
Research Institute**

(Deemed-to-Be-University declared by Govt. of India under Section 3 of UGC Act, 1956)

**Belur Math, Howrah 711202, West Bengal
(www.rkmvu.ac.in)**

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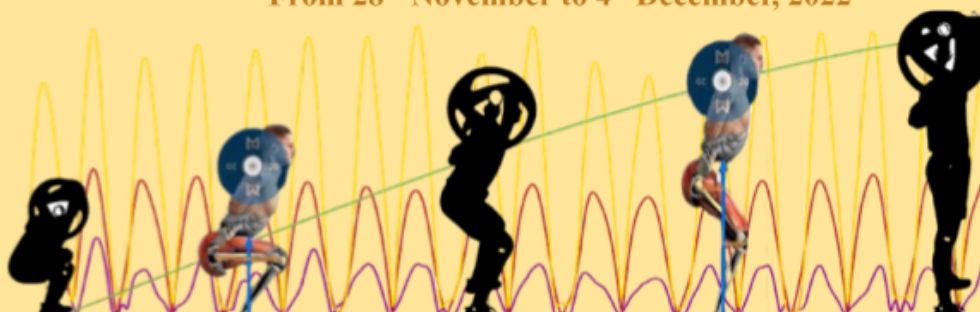


Organising an

Immersion Program on Sports Biomechanics



From 28th November to 4th December, 2022



Resource Persons



Dr. R. Giridharan
Associate Professor and HoD
Faculty of General & Adapted Physical
Education and Yoga, Coimbatore



Dr. Rahul Tiwari
Biomechanics Lead
Sports Authority of India, Netaji Subhas
National Institute of Sports, Patiala



Dr. Hemanjit Gogoi
Assistant Professor
Sri Sri Aniruddhadeva Sports University,
Dibrugarh, Assam

Highlights of the Workshop:

- Biomechanical needs for abled and special sportsperson
- Kinesiological analysis of sporting movements
- 2-D video analysis
- Jump analysis
- Performance analysis
- Sports shoes analysis

- Hands on experience on software based video analysis
- Notational analysis of sports performance
- Ethical issues in biomechanical studies
- Modern gadgets for sports performance monitoring and analysis

Contact us: sportsse.rkmvu@gmail.com Coordinator, SSY

About RKMVERI

Ramakrishna Mission Vivekananda Educational & Research Institute (RKMVERI), declared by the Government of India as a Deemed University, is a multi-campus University with its Headquarters at Belur Math, West Bengal. Under the aegis of the renowned philanthropic and charitable organization 'Ramakrishna Mission', the University was started in 2005 with a vision to be a Centre of learning blending the twin excellences of ancient Indian wisdom and modern scientific knowledge and technological skill, imparting life-building, character making education. Its mission is to strive for excellence in teaching, research and all academic endeavors, blend it with Eastern and Western values, to develop integrated personalities harmoniously combining the three H's – Heart to feel, Head to think, Hands to work along with a deep sense of social responsibility.



Established in 2005, RKMVERI is an institution deemed-to-be university as declared by the Ministry of Human Resource Development, Govt. of India, under Section 3 of University Grants Commission (UGC) Act, 1956. At present, it operates through four campuses situated at the following locations: Belur Math near Kolkata (main campus and headquarters), Coimbatore, Narendrapur (Kolkata) and Ranchi. The multi-campus university houses many departments organized under 5 schools, covering a diverse range of subjects such as Sanskrit studies, physics, mathematics, computer science, yoga, rural and tribal development, agriculture, disability management, disaster management, etc. and conducting programmes at various levels ranging from undergraduate/diploma to doctoral. The university also expends special effort in meaningfully engaging with the general public by conducting certificate courses and other specially designed classes, such as classes on Indian spiritual heritage (conducted by monastic faculty members), spoken Sanskrit, Indian classical music, etc.

Apart from the above mentioned educational activities, the university also actively engages in various outreach programmes intended to make a contribution to the society at large. It runs an information and communication technology based network known as Vivekdisha that performs a wide range of activities such as providing online education from secondary to undergraduate level, conducting research programs, running a portal for taking online examinations, conducting online teachers' training and

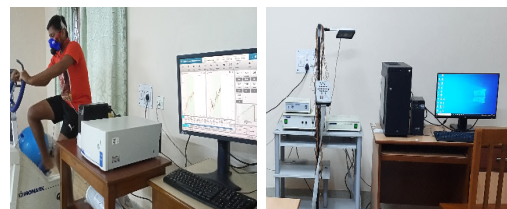
workshops, etc. The university also operates a Krishi Vigyan Kendra, an initiative of ICAR, Govt. of India for technology transfer in the fields of agriculture, horticulture, animal husbandry, aquaculture etc. RKMVERI also functioned as a nodal institute for District Yoga Wellness Centre scheme for a period from 2010 to 2013.

For India to attain excellence in the fields of arts and sciences and various other fields of knowledge, the whole society and especially the youth must be given the opportunity to become fully cognizant of the glorious past heritage of the country and at the same time be trained in modern scientific ways of thinking. While instilling the students with pride in the past achievements of their forefathers and firing them with the zeal to strive for rejuvenation of the country in all spheres of human excellence, education must also kindle in them great sympathy for their poor and the underprivileged brethren by revealing to them their indebtedness to the masses. All activities of RKMVERI, whether it be the educational focus on the thrust areas, engagement with the local populace or its general outreach programs, are oriented towards bringing this wholesome vision of education into a reality.

About Department of Sports Science and Yoga

In the year 2012, the University established a full- fledged academic department to promote scientific study and research related to sports, including adapted sports, and yoga - 'Department of Sports Science & Yoga'.

The five-storey building christened as 'Atma-Vikas' (literally, five-layered self-development) houses the Department of Sports



Science and Yoga, equipped with modern laboratories and classrooms, state-of-the-art conference room, a fully functional fitness centre and huge Yoga halls, dedicated exclusively to teaching and research in the fields of Sports Sciences and Yoga.

About the Immersion Program




Motivation, effective training, 360 degree scientific support, nutrition, tactical planning and other aspects play a role in sporting success. India's performance in the recently concluded Tokyo 2020 Summer Olympics and Paralympics, where India won 7 medals including one precious gold medal won by Neeraj Chopra in Javelin throw, signifies the importance of proper training and recovery management. An incredible 19 medals achievement in Paralympics, including 5 gold medals, further demonstrated the importance of scientific support during training. To compete and level with the internationally leading countries in sports arena, it is necessary for Indian support staff, aspiring professionals, and students to develop knowledge and skills in sports science and biomechanics by using latest technologies and advanced tools to analyze athletes posture, movements and techniques and based on that to provide necessary suggestions to improve performance.

To cater this modern-era of scientific approach to sports, Department of Sports Science and Yoga of RKMVERI, Belur Math, West Bengal is organizing week long session on 'Adapted Sports and Sports Biomechanics'. 30 seats are available for this workshop and seats will be served based on scrutinizing the applications

The workshop will be held offline and mostly hands-on

End of the session the participants will be able to understand the importance of biomechanics in sports science, techniques, and how the support helps in improving health, fitness and performance.

Speakers

	Dr. R. Giridharan Associate Professor and Head Faculty of General & Adapted Physical Education and Yoga, RKMVERI, Coimbatore and UNESCO Chair holder in Inclusive Adapted Physical Education and Yoga
	Dr. Rahul Tiwari Biomechanics Lead Sports Authority of India, Netaji Subhas National Institute of Sports, Patiala
	Dr. Hemanjit Gogoi Assistant Professor Sri Sri Aniruddhadeva Sports University, Dibrugarh, Assam

Participants

A total number of 33 participants from different disciplines like sports science, sports physiology, physical education registered for this event. All students currently studying at DSSY, had participated in this event.

Schedule

Sessions			
Day	Morning (10:30am - 1:30pm)	1:30 pm - 2:30 pm	Evening (2:30pm - 4:30pm)
Day 1: 28/11/2022 (Monday)	Session I: 1. Introduction to adapted sports physical activity <i>Resource person: Dr. R. Giridharan</i> 2. Fundamentals of Sports Biomechanics <i>Resource person: Dr. Rahul Tiwari</i> <i>Venue: Arnavikas 308</i>	L U N C H B R E A K	Session II: Designing activities for special population <i>Resource person: Dr. R. Giridharan</i> <i>Venue: Arnavikas 308</i>
Day 2: 29/11/2022 (Tuesday)	Session III: 1. Fundamental movement training 2. Special equipment for differed disabilities <i>Resource person: Dr. R. Giridharan</i> <i>Venue: Arnavikas 308</i>		Session IV: 2D video recording & analysis <i>Resource person: Dr. Rahul Tiwari</i> <i>Venue: Arnavikas 308</i>
Day 3: 30/11/2022 (Wednesday)	Session V: 1. Kinesiological analysis of sporting movement 2. Understanding isokinetic device <i>Resource person: Dr. Rahul Tiwari</i> <i>Venue: Arnavikas 308</i>		Session VI: 2D video recording & analysis <i>Resource person: Dr. Hemantajit Gogoi</i> <i>Venue: Arnavikas 308</i>
Day 4: 1/12/2022 (Thursday)	Session VII: 1. Ethical issues in biomechanical studies 2. Modern gadgets for sports performance monitoring and analysis <i>Resource person: Dr. Hemantajit Gogoi</i> <i>Venue: Arnavikas 308</i>		Session VIII: 1. Force measurement using force platform 2. Jumping analysis without force platform <i>Resource person: Dr. Rahul Tiwari</i> <i>Venue: Arnavikas 308</i>
Day 5: 2/12/2022 (Friday)	Session IX: 1. Multidisciplinary approach for sports performance analysis 2. How to choose correct sports shoes <i>Resource person: Dr. Rahul Tiwari</i> <i>Venue: Arnavikas 308</i>		Session X: Sports Performance analysis <i>Resource person: Dr. Rahul Tiwari & Dr. Hemantajit Gogoi</i> <i>Venue: Arnavikas 308</i>
Day 6: 3/12/2022 (Saturday)	Session XI: 1. Assignment/Fun Quiz/Exam <i>Venue: Arnavikas 308</i>		Session XII: 1. Feedback collection 2. Valedictory function & certificate distribution <i>Venue: Saradananda Seminar Hall</i>

Session Details:

DAY-1: 28/11/2022:

MORNING SESSION (SESSION-I) **(Taken by Dr. R. Giridharan and Dr. Rahul Tiwari)**

1. Introduction to adapted sports physical activity:

As participants were not very accustomed to Adapted Sports, hence the speaker had given a basic introduction about the field. He had given a detailed lecture focussing on the need of Adaptive Sports and different types of Physical Activities required for participation in Adaptive Sports.



2. Fundamentals of Sports Biomechanics:

Since the majority of the participants were from different backgrounds, Sports Biomechanics was a completely new concept for them. At first, participants' knowledge about the field was tested which showed more curiosity than answers. Hence, the speaker briefed about the subject from scratch.



EVENING SESSION (SESSION-II) **(Taken by Dr. R. Giridharan)**



Designing activities for special population:

The speaker took an introductory practical session on certain Adaptive Sports and participants actively participated in those sports. After the session, all of them gave satisfactory feedback.

DAY-2: 29/11/2022

MORNING SESSION (SESSION-III)

(Taken by Dr. R. Giridharan)

1. Fundamental movement training:

A Practical session involving all the participants were taken in the first hour on field regarding Adaptive Sports and Training Regimen for disabled. The participants were made to warm up by light jogging and stretching, followed by Adaptive Games to develop motor abilities.



2. Special equipment for differed disabilities:

Finally, the participants were given hands-on demonstrations in certain Adaptive games with Balls with Bells. The session was thoroughly enjoyed by everyone involved.

EVENING SESSION (SESSION-IV):

(Taken by Dr. Rahul Tiwari)

2D video recording & analysis:

A basic introduction to Video Analysis Softwares were given, which were alien to most of the participants present. The Speaker gave an orientation on Kinovea and Dartfish as well. These are the basic softwares mostly used for 2D Analysis.

In order to perform accurate analysis, the video needs to be captured with a high Frame Rate (120FPS). A Video Recording camera with high specifications and Go- Pros were shown to the participants.



DAY-3: 30/11/2022:
MORNING SESSION (SESSION-V):
(Taken by Dr. Rahul Tiwari)

1. Understanding isokinetic device:

A presentation and lecture on isokinetic devices and its working mechanism were given. Furthermore, the importance of such devices in assessing the Biomechanics of movement of an individual was explained thoroughly. The participants had shown keenness in the working and functioning of Isokinetic Devices.



EVENING SESSION (SESSION-VI):
(Taken by Dr. Hemantajit Gogoi)



2D video recording & analysis:

A further detailed session on Kinovea was taken in which the participants could download the software and analyze sample videos on their own. The participants could interact with the speaker and orient themselves with the Software hands-on. Such practical work on Kinovea gave them an idea about Biomechanical Analysis which they were highly interested in.

DAY-4: 01/12/2022:
MORNING SESSION (SESSION-VII):
(Taken by Dr. Hemantajit Gogoi)

1. Ethical issues in biomechanical studies:

Speaker had presented on the given heading focusing on what are the basic ethical measures every researcher should follow while doing research associated with some biomechanical aspects.

2. **Modern gadgets for sports performance monitoring and analysis:**

Demonstration on how performance analysis is done and athletes monitored using high end video recording devices were given to the participants. A detailed session was also taken and everyone participated in the monitoring and assessment using Kinovea. Moreover, discussion on the operation of Android device applications like APECS to calculate the Centre of Gravity of an individual was also carried out.



**EVENING SESSION (SESSION-VIII):
(Taken by Dr. Rahul Tiwari)**

1. **Force measurement using force platform:**

Speaker had briefed about the uses of the force platform and its importance in sports performance analysis. He had shown a testing report generated from a force platform and detailed about various factors mentioned inside it.

2. **Jumping analysis without force platform:**

At first participants were made to understand the basics of video capturing for analysis. Then with a captured video of jumping, the analysis was done using Kinovea software.

**DAY-5: 02/12/2022:
MORNING SESSION (SESSION-IX):
(Taken by Dr. Rahul Tiwari)**

1. **Multidisciplinary approach for sports performance analysis:**

In this session, focus was on how to analyze an athlete's performance following a multidisciplinary approach. Not only sports biomechanics can solve the purpose, but also other domains of sports science like sports physiology, psychology, strength & conditioning etc. are equally important.



2. How to choose correct sports shoes:

An in depth description was given as to how the shoe one wears affects performance and changes the dynamics of lower limb movement. Different shoe categories ideal for various foot types were shown and how it affects the performance was described. How shoes are different for flat-foot and the sole and heel support affects runners and sprinters was also heavily emphasized. The participants could relate to the shoes they wear and the level of comfort with each type according to their feet.

EVENING SESSION (SESSION-X):

(Taken by Dr. Rahul Tiwari & Dr. Hemantjit Gogoi)

Sports Performance analysis:

In this session, real time video recording was done by the participants and the recorded clips were analyzed by all in Kinovea in order to gain practical experience. The Centre of Gravity was calculated along with movement patterns and many other biomechanical parameters assessed.

The participants could also download APECS on their mobile phones and calculate the Centre of Gravity of an individual's posture by taking images. Furthermore, other mobile applications like Punch Speed were also demonstrated.

DAY-6: 03/12/2022:

MORNING SESSION (SESSION-XI):

Assignment/Fun Quiz/Exam:

An overall assessment was done by all the speakers on the basics of Biomechanics and Adaptive Sports based on the content taught during the workshop. The attendees were made to participate in multiple quizzes and a doubt clearing session was also taken in order to clarify all the doubts of the participants regarding the topic of the workshop.



EVENING SESSION (SESSION-XII):

1. **Feedback collection:**

Feedback was collected from participants at the end.



2. **Valedictory function & certificate distribution:**

At the end, a valedictory function was carried out at the seminar hall and then certificates were distributed.



Conclusion:

The entire workshop on Immersion Program on Adaptive Sports and Biomechanics was concluded successfully with Concluding speech from Hon'ble Vice-Chancellor of RKMVERI. A group photograph was taken including all involved after distribution of the certificates.

All the participants shared Excellent feedback and demanded more such workshops providing hands-on working experience.

The purpose of the Workshop was fulfilled and ended Successfully.

