

**A Report of  
One Week Online Workshop  
on  
Assessment and Management of Strength**



**Submitted  
to  
Rajiv Gandhi University**

**Conducted by**

**Faculty of Physical Education and Sports Sciences  
in Collaboration with  
IQAC, RGU**

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I will fail in my duty if I will not acknowledge the support and consent provided by all the esteemed resource persons of this workshop. We approached him for this programme and they not only accept our invitation, they also suggest some technical inputs to improve quality of this programme. I am especially thankful to Mr. Yogesh Diwedi and Mr. Martin Gayller for sharing their knowledge and expertise in field of Strength and Conditioning.

Dr. Vivek Kumar Singh  
Convener

## **Executive Summary:**

One Week Workshop on Assessment and Management of Strength conducted with motive to providing concept of strength training in respect to requirement of athlete and their muscles strength condition. Strength is essential component of motor fitness which provide base for development of endurance, speed, flexibility, coordination, balance and other fitness abilities. Now days sports has been very role specific and players have to be prepared according to their role in the team. In such kind of situation where players are playing throughout the year with different teams at different level in such kind of situation they have to be fit and available for every match and it is only possible through when they received customized training plane that should be based on assessment of their muscles strength. With this view in this workshop participants learned about different concepts of strength assessment i. e. 1RM Method, 3RM Method, 5RM Method, which can be used with athlete with different level of fitness. In this workshop one striking point was correctness of movement sequence while a player is performing any kind of exercise to improve his strength or fitness. If player or individual is not performing correct movement pattern in that case the activity may be injurious for him and their recovery may be delayed and player may lose their acquired strength and fitness. After strength assessment, training should be planned according to goal of player. Goal may be long term, medium term and short term. In different conditions training must be varied. To train the athlete, they need well established weight room or fitness training centre. Weight room management play a vital role in achieving desired level of fitness, as a well equipped weight room contain warm-up area, free space to roam around, free weights, Cybex machines, Plyometric stations, cardio stations and many more. So a weight room should have appropriate space to accommodate all important equipments. If there is lack of space in that case equipment should be accommodated on priority basis. While participants got to know that in time of technology and internet strength and conditioning coaches and even players have misconception that strength training should not be assigned to young athletes as it may negatively affect their growth plate development. While reality is just opposite of it, if young athletes will go through structured resistance training in guidance of well trained coach in that case strength training may play a key role in success of players at even junior level also

## Part: 1

# Preface

### 1.1 The University

Rajiv Gandhi University (formerly Arunachal University) is the premier institution for higher education in the state of Arunachal Pradesh and has completed thirty-six years of its existence. Late Smt. Indira Gandhi, the then Prime Minister of India, laid the foundation stone of the university on 4th February 1984 at Rono Hills, where the present campus is located. Ever since its inception, the university has been trying to achieve excellence and fulfil the objectives as envisaged in the University Act. The University received academic recognition under section 2(f) from the University Grants Commission on 28th March, 1985 and started functioning since 1st April, 1985. It received financial recognition under section 12-B of the UGC on 25th March, 1994. Since then Rajiv Gandhi University then Arunachal University has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high-level expert committee of University Grants Commission from among universities in India. The University was converted into a Central University with effect from 9th April 2007, according to a notification by the Ministry of Human Resource Development, Government of India. Being the only Central University of the State at present there are Twenty Nine (29) Departments and Two (02) Institutes functioning under Eleven (11) Academic Faculties. The Faculty members have been actively engaged in research activities. The University has been maintaining its academic excellence and individuals from its alumni group are contributing at significant positions not only in State and Central Government Services, but also in various Institutions, Industries and Organizations. The University has continuously maintained its premier status among top hundred (100) educational institutions in NIRF ranking across India.

### Faculty of Physical Education and Sports Sciences

Department of Physical Education a constituent unit of Rajiv Gandhi University (A Central University) established in the year 2015 to promote physical education and develop an interest among people regarding the need and importance sports and exercise which is medium to improve the community health. It is 1<sup>st</sup> and only one department of physical education in Arunachal Pradesh. The syllabi of the courses are so designed as to prepare professionally qualified leaders and teachers in physical education. The

infrastructures developed are as per the NCTE standard and norms. A team of competent and dedicated teachers are engaged in relentless pursuit of excellence in Physical Education and Sports for health, fitness and wellness of the citizens. Department was offering BPEd since its inception and full time Ph. D from 2019-20. From the session 2020-21 department has introduced various courses in sports science with the grant received by Ministry of Youth Affairs and Sports. As department was offering large number of courses in physical education and sports sciences, university administration has provided its own identity by upgraded department of physical education as faculty of physical education and sports sciences. Now faculty of physical education and sports sciences is offering PG degree in Sports Psychology, Sports Physiology, Sports Biomechanics and Strength Training & Conditioning, while six month certificate course is being offered in Sports Anthropometry and Strength Training & Conditioning. Numerous students from department have got admission in MPEd in renowned institutions like LNIPE, Gwalior, LNIPE: NERC, Guwahati, LNCPE: Trivandrum and BHU. Under its extension activities, department also provides yoga classes, boxing training, leadership camp and organised workshop and webinars to provide latest information to the aspirants of Physical Education and Sports Sciences.

## **1.2 Sponsoring Agency**

The Program was sponsored by the Rajiv Gandhi University.

## **1.3 Background**

A Strength and Conditioning (S&C) expert plans, delivers and reviews the physical and physiological preparation of athletes aligned to specific sports performance outcomes. In order to do this, Strength and Conditioning Coaches have a deep understanding of the physical characteristics required to excel in sports performance. They understand what it takes for an athlete to be resilient to the demands of the intensity and volume within their training environment thus maximizing the technical training opportunities in their respective sports. Plans can then be specifically tailored to the adaptations required, and, maximized in the strength and conditioning coaching environment in-line with the culture of the sport.

“Strength training is about more than lifting weights – it encompasses the entire physical development of the athlete and what is required to allow them to be the best physical version of themselves.”

- *From English Institute of Sport*

Strength involves testing, monitoring and diagnostics to inform programmes. Planning and programming to maximize adaptation and optimize performance. Coaching to bring life programme in an appropriate climate and culture aligned to the sport to maximise adaptations.

Strength Training works mainly on two main objectives:

- Improve performance
- Reduce risk of injury

S&C coaches use scientific theory and apply it to delivering training through an athlete's journey from young talented athlete to performance athlete. Strength and Conditioning coaches utilise a performance backwards approach to model performance impacting training prescription based on the holistic needs of the athlete. They support the problem solving of performance questions within the sport through genuine curiosity and a constant drive to support athletes. This is based on a deep understanding of the sports we work with, their culture and the relationships between all those involved, which means we are able to integrate rapidly, build trust and add value.

Strength is classic performance ability of all athletes. It is vital to power development at higher level of force and provides the physiological stimuli needed for collateral development of other systems. The development of strength is crucial for almost all sports for potentially different reasons. (Bill Foran). Thus development of strength according to requirement of athletes is crucial and it require appropriate testing to know the exact level of strength in athletes which can enable the trainers to provide well designed strength training module for the specific need of athletes.

Strength is component of fitness which lay foundation for development of other motor fitness components, development of sports performance and recovery from injuries. Thus it is important that strength should assess properly and scientific approach should be adopted in periodization of strength training.

**Department of Physical Education and Sports Sciences** with the vision of **Sasakt Bharat** conducted a **Seven Day Workshop on "Assessment and Management of Strength"** from 18<sup>th</sup> to 24<sup>th</sup>

**June 2021** onwards to educate and train the teaching, coaching and training fraternity about assessment and management of strength. As strength is a component of fitness that lays a foundation for the development of other motor fitness components, development of sports performance and recovery from injuries. Thus strength must be assessed accurately and a scientific approach should be adopted in the periodization of strength training.

In North-Eastern region, our department become the first centre/department to host a workshop on Assessment and Management of Strength with international experts which was a step towards **Kaushal Bharat Kushal Bharat**. The workshop provided an opportunity to learn the scientific concept of strength assessment and management which has been an essential skill in the fitness industry which is also offering healthy job opportunities for the aspirants.

#### 1.4 Objectives

- To introduce performance-based Strength & Conditioning concept by covering a variety skills required for performance sport.
- Give a deeper understanding of strength training.
- To develop the movement competency through assessment of movement.
- To develop competency in need analysis for different sports.
- To give an insight into methods used across performance sport across the world.
- Give attendees practical experience trying new methods and applying new concepts.
- Allow participants to apply new information for the athletes they work with.

#### 1.5 Expected Outcomes

- Increase the potential to produce better athletes.
- Reduce injuries and have more time on the field (because they are not injured)
- It enabled the participants to understand the concept of strength and use different means to assess the strength.
- Through this workshop participants learned to assess the work load of athletes and to assign work load for performance improvement of a player.



- Participants learned to design customized training programme including appropriate exercises of upper body, core and lower body.
- Through application of scientific principles coaches can develop fit pool of players who can win medals for their country at different international tournaments.

### 1.6 Themes and Sub-themes

- Movement Competency and Initial Assessment of Athlete
- Facts and myths of strength and strength training
- Components of Strength
- Load Assignment
- Use of Technology in Strength Training
- Needs Analysis of Strength in Elite Sports
- Planning Strength Training in a Busy Calendar
- Testing Strength in Football Squad
- Practical: Strength Assessment
- Practical: Programme Designing based on Result
- Management of Athletes in Weight Room
- Creating Performance Environment
- Exercise Categories and Exercise Selection
- Programme Designing and Monitoring for Development of Strength

### 1.7 Resource Persons

Sl. No.	Name	Designation & Address
1.	Anand Date	Strength & Conditioning Coach at National Cricket Academy - BCCI
2.	Martin Gallyer	Former Strength and Conditioning Coach of Cricket West Indies
3.	Asia Joseph	Strength and Conditioning Coach at Florida International University
4.	Yogesh Dwivedi	Strength and Conditioning Coach, High Performance Centre, Sports Authority of Gujarat
5.	Mark Farrell	Performance Coach of Scottish Football Association

### 1.8 Target Population

- Fitness Coaches working in Sport

- Faculties of Sports Sciences and Physical Education
- Physical Education Teachers
- Personal Trainers
- Physiotherapists
- Sport Coaches
- Sport Persons/Students
- All Fitness Enthusiast Persons

## **1.9 Budget**

The estimated budget of the programme is Rs. 26,512/- which includes honorarium to the Resource Persons and other Miscellaneous Expenses.

## **1.10 Modus Operandi**

All the sessions of this One Week Workshop on Assessment and Management of Strength was delivered through the online using Google Meet. Also all the sessions was recorded for attendance and monitoring purposes.

## **Part 2: Session Wise Deliberations**

### **2.1 Inaugural Session: (17.08.2020) 11.00 AM-12.00 PM**

Faculty of Physical Education and Sports Sciences in Collaboration with IQAC, Rajiv Gandhi University inaugurated One Week Online Workshop on Assessment and Management of Strength at 2.20 PM on 18<sup>th</sup> June. Dr. Tadang Minu, HoD, Physical Education has welcome the distinguish guest in her welcome address, while Prof. Amitava Mitra, Pro Vice Chancellor of RGU rightly pointed that now days sports has been technology oriented and the task has been very specific for the support staff of a team and if we really want success in sports arena we have to adopt new training methods. Prof. Saket Kushwaha, Honourable Vice Chancellor of Rajiv Gandhi University grace the occasion as chief guest and his address he revealed that such kind of training programmes for trainers and coaches are the need of hour and university will constantly provide support such kind of initiatives. He also recognised the effort of Dr. Anil Mile, former Head of Physical Education Department who worked hard for development of this department.

Inaugural session was also addressed by Dr. N. T. Rikam, Registrar of RGU and Prof. R. C. Parida, Chairman, IQAC.

Dr. Vivek Kumar Singh was the host of inaugural session; Dr. K. Rojeet Singh proposed the vote of thanks. Dr. Anil Mili, Dr. Sambhu Prasad and Ms. Moyir Riba also assisted the organisation of entire inaugural ceremony.

## **2.2 Plenary Session: Keynote Address**

Anand Date (Strength & Conditioning Coach at National Cricket Academy – BCCI) was the keynote speaker of inaugural session he delivered the keynote address on Strength and Conditioning Nuances and Indian Sports Science Eco-System. Mr. Anad explained the evolvement of Strength and Conditioning and how it becomes integral part of sports. He explained that strength and conditioning coach work for a team with physiotherapist, high performance manager, assistant coach, coach and team manager for ultimate development of an athlete. To enhance physical performance a S&C coach must assess athlete, sports in which athlete is participating, and then understand the latest trends are going in training and even the training schedule of elite athletes and best athletes can also help to fitness development of player in observation. S&C coach must talk to player and try to understand his desired goal; coach should motivate the player to break the hurdles to enhance the fitness level. Key of the lecture was “The essentials of good S&C coach”. A good coach must be well trained, educated and competent. He should have education degree from well renowned institutes like ASCA, UKSCA, CSCS. Coach must be well trained and should have worked at different levels and different sports athletes. On top of these his attitude is very important to upgrade himself with latest technologies and research.

## **2.3 Technical Sessions:**

**Day 1:** (18<sup>th</sup> June, 2021): 1<sup>st</sup> Technical Session

**Speaker:** Martin Gallyer

**Topic:** Movement Competency and Initial Assessment of Athlete

Martin Gallyer explained about Movement Competency and Initial Assessment of Athletes. He cleared the very valid point that performance of player not only depends on movement assessment, there are certain other factors who determine the performance of players, but movement assessment can help the

trainers to diagnose the need of their trainee players and provide training and exercise according to their requirement.

The Functional Movement Screen was developed to help clinicians and health care professions screen individuals for risk of injury and / or a dysfunctional or performance-limiting movement pattern. The FMS was first presented commercially as a manual for screening athletes and the product line was later expanded to include a range of equipment for performing the screen, certifications for those screening athletes, seminars, books, and videos.

The FMS is a tool used to identify asymmetries which result in functional movement deficiencies. The FMS aims to identify imbalances in mobility and stability during seven fundamental movement patterns. These movement patterns are designed to provide observable performance of basic locomotor, manipulative and stabilising movements by placing an individual in extreme positions where weaknesses and imbalances become noticeable if appropriate mobility and motor control is not utilised. Once these deficiencies have been identified through the FMS, a program of corrective exercises is then developed with the goal of preventing musculoskeletal injuries. The FMS consists of seven movement patterns which require mobility and stability. The seven following movement patterns are scored from 0-3 points.

1. Deep Squat
2. Hurdle Step
3. In-line Lunge
4. Active Straight-leg Raise
5. Trunk Stability Push-up
6. Rotary Stability
7. Shoulder Mobility

**Day 1:** (18<sup>th</sup> June, 2021): 2<sup>nd</sup> Technical Session

**Speaker:** Martin Gallyer

**Topic:** Movement Competency and Initial Assessment of Athlete, Practical

2nd session was practical session of movement assessment that started with introduction of 7 exercises; Deep Squat, Hurdle Step, In-line Lunge, Active Straight-leg Raise, Trunk Stability Push-up, Rotary Stability, Shoulder Mobility to assess the movement competency of players. It was a quit interesting session in which participants actively participated with gym equipments and learned that

what should be the ideal position during any activity. In this session participants assessed each other performance and assigned scores according to others performance. They learned if any athlete or player is not able to perform the movement correctly, what can be the possible reason behind it, like lack of physical capacity; player may be lacking in physical mobility or lacking adequate strength. Another possible reason may be lack of knowledge required to learn movement patter, or it may be due to lack of cognitive or associative learning. The key of the session was that before any assessment or training coach must aware about players medical condition. Player must have clearance from physio and must provide his/her past history of injuries, if there is any.

**Day 2:** (19<sup>th</sup> June, 2021): 1<sup>st</sup> Technical Session

**Speaker:** Mr. Yogesh Dwivedi

**Topic:** Management of Strength

Mr. Yogesh Dwivedi addressed the participant by expressing his gratitude to Rajiv Gandhi University to invite him for deliver the lecture on this One Week Workshop on Assessment and Management of Strength. He begun the session with history of strength training, it was Milo of Croton in 6<sup>th</sup> Century BC. that is known as inventor of strength training. After that he explained about myths and reality of strength training. Peoples have myth that, resistance training bad for young and children's athletes, it damage growth plate with resistance training. Resistance training before growth plate closure is not inherently harmful. No Increased incidence of epiphyseal plate injury. While the fact is No scientific evidence indicates that resistance training will have an adverse effect on linear growth or reduce adult height in children and adolescents. High risk of injury with resistance training is another myth that players and coaches have about strength training. While reality is when supervised resistance training is provided, there is no additional risk of injury. Avoid improper form and lifting program design. Peoples also think that strength training is only for those who are 15 years or above, while children can start resistance training at 6-7 year of age when they have the maturity to follow instructions in a safe environment. Excessive muscle growth and hypertrophy is another misconception among sports fraternity. While strength gains before puberty are driven by neuromuscular development instead of increases in muscle mass. Muscle mass changes during adolescence due to the increased hormonal concentration of testosterone and IGLF, mainly

in male but not in female youth athletes. He also discussed about concept of strength and explained that strength is the ability of the neuromuscular system to produce force against external resistance. strength is the ability to overcome resistance and resist unwanted movement by producing force. He also discussed about components of strength:

**Maximal Dynamic Strength** is the maximum force that a muscle or group of muscles can exert against a resistance in a single, voluntary, dynamic effort

**General Strength** Hypertrophy or the growth of muscle size under pins most changes in muscle function and may provides a sort of “armour” that also provides stability against unwarranted movement and protects joints in collision sports. Training to increase muscle size leads to very generalized increases in strength

**Maximal Strength** is the ability to produce high levels of force – this may be to overcome resistances to movement or resist high levels of force that negatively impact movement quality.

**Speed-Strength** is the ability to quickly execute an unloaded movement or a movement against a relatively small resistance.

Finally he concluded the session with the question about absolute and relative strength. He asked from participants think about your sport, which one is more important and why?

**Day 2:** (19<sup>th</sup> June, 2021): 2<sup>nd</sup> Technical Session

**Speaker:** Mr. Yogesh Dwivedi

**Topic:** Management of Strength

In the second session of day different methods of strength assessment was discussed like 1-RM test, 3-RM test, 5-RM test, REP Max Method, Percentage based Method. The one-repetition maximum (1RM) test is often considered as the ‘gold standard’ for assessing the strength capacity of individuals in non-laboratory environments. It is simply defined as the maximal weight an individual can lift for only one repetition with correct technique. The 1RM test is most commonly used by strength and conditioning coaches to assess strength capacities, strength imbalances, and to evaluate the effectiveness of training programmes.

The diversity of the 1RM test means that it is not limited to only one exercise, instead it can be conducted using a wide variety of exercises such as: back squat, leg press, leg extension, leg curl, bench press, chest press, lat pull-down, seated low row, and the Olympic Clean – to name just a few. It has been suggested that novice lifters should not perform a 1RM strength test, simply because lifting maximal weight by individuals not accustomed to weight training may induce large degrees of muscle soreness and increase the risk of a more serious injury. Performing a maximum weight lift is only for advanced weight trainers. It is important to have good technique before attempting this test.

While participants learned about interpretation of Force Velocity Curve and use of different applications to measure the strength ability of players. The force-velocity curve is simply a relationship between force and velocity and can, therefore, be displayed on an x-y graph. The x-axis (i.e. horizontal axis) indicates velocity, for example, this may represent muscle contraction velocity, or velocity of movement (measured in meters per second). Whilst the y-axis (i.e. vertical axis) indicates force, for example, this may represent muscle contractile force, or the amount of ground reaction force produced.

As power is a key determinant in the performances of many sports, optimising an athlete's power production is of great importance. Because power is the product of force multiplied by velocity improving either of these components can lead to increased power production and therefore the explosiveness of the athlete. In most circumstances, the primary objective of strength and power training is to shift the force-velocity curve to the right, resulting in the athlete being able to move larger loads at higher velocities and therefore becoming more explosive. Shifting the force-velocity curve to the right represents an improved rate of force development. The rate of force development simply reflects how fast an athlete can develop force. An athlete with greater rate of force development capabilities will be more explosive as they can develop larger forces in a shorter period of time.

**Day 3:** (20<sup>th</sup> June, 2021): 1<sup>st</sup> Technical Session

**Speaker:** Asia Joseph

**Topic:** Management of Athletes in Weight Room

Asia Joseph started her deliberation with concept about management of athletes in weight room.

Weight room management involves:



As weight room is a place where athlete devote their time and energy so it is very important that there should be proper safety for the athlete along with the well trained coach. She insisted the significance of CPR expert in weight room because during session any kind of injury may occur and specifically when players are lifting too heavy weight. She also revealed that there should be guideline and protocol for the players as well as training staffs.

It is layout organisation of the gym that is truly important to provide proper space to the equipment as well as players. If there is shortage of space in that condition priority should be given to important equipments. Yes equipment placing in the gym is also important and it should be arranged in such a way that the trainer can observe all the athletes from every corner of the weight room. Placing equipments according to the zone is also important and equipment can be placed as Cardio, racks, kettlebells or free weights.

In weight room for better management of athletes they can be divided in different training group based on; events, strength level, need of players or team, level of participation. At the end of her discussion she revealed that different strategies should be adopted for different goals. Like for training camp, clinical session and visiting session there should be different strategies.

**Day 3:** (20<sup>th</sup> June, 2021): 2<sup>nd</sup> Technical Session

**Speaker:** Asia Joseph



## **Topic:** Creating Performance Environment

She started her presentation with discussion on high performance and how performance environment can help to achieve high performance. High-performance programs are about culture. And culture is more about the attitude of people working for the athletes and the drive they demonstrate to do what is necessary to foster the athlete's development. She discussed about different aspects for high performance,

**Consistency:** Performance culture must be about the consistency of service delivery. Every single day, each staff member must show up with the same level of vigour, drive, and patience they did the day before. A staff that can perform and deliver, no matter the circumstances, sets a level of modelling for the athlete that is imperative. Energy and focus must not fluctuate.

**Collaboration:** A performance culture is about collaboration. Barriers to this often include fear and ego. If you approach another professional and express an opinion and they are not open to discussion, don't take it personally and don't bother "going in the ditch." Not everyone is ready for you and new ideas. You need to know this and instead seek those who are not afraid of debate. True collaboration is about knowing the strengths of those around you and putting your ego aside when you need to ask for help. Collaboration, though, works best when two or more individuals have a similar value system and work ethic.

**Communication:** A performance culture is about frequent communication with athletes. Very little is new in sport science in terms of training methodology. However, we can be innovative about how we deliver programming. With so many accessible platforms for athletes, it's easier and faster to communicate than ever before. Besides the face-to-face communication during training sessions, it's important to touch base with athletes regularly and ask for their feedback: text, instant message, phone, or video chat. Athlete feedback should be the basis of decision-making, and we won't know how athletes are feeling or experiencing the training until we ask. Having a close relationship with athletes is not unprofessional. Trust must be built, and it's through open channels of communication where we can foster it even further. And finally it is feedback that can help to improve further in respect to creating performance environment. It should be structured.

She also discussed about transformational leadership in which she explained coach should develop responsibility, accountability and leadership in their players. It is important that player should involve in

decision making. She discusses that coach should concern about players injury management, welfare of players, players equipment and their facilities.

**Day 4:** (21<sup>th</sup> June, 2021): 1<sup>st</sup> and 2<sup>nd</sup> Technical Session

**Speaker:** Martin Gallyer and Yogesh Dwivedi

**Topic:** Practical: Strength Assessment

Day 4 was the day of practical sessions. Both sessions of this day was devoted for practical of Force Velocity Assessment and Rep max test. Initially protocol of both the test was discussed and then test was conducted by Mr. Yogesh Dwivedi with help of his trainee players at SAG centre.

Prior to the actual testing, it is a good idea to have some idea as to what the person's maximal strength level is; even if it is more of a ballpark estimate. The participant should perform a warm-up with a self-selected load that will allow them to complete a minimum of 6-10 repetitions (approx. 50% predicted 1RM). The first warm-up set should involve a very light resistance for five to ten repetitions. "Light" could mean the empty bar for some, 60kg for others, and possibly even more than that for the very strong. Whatever the case may be, the first set should feel extremely easy. Following the first warm-up set, there might be two or three sets of three to five repetitions of increasing, yet still easy, weight. 1-5 minute rest (decided by test administrator).

Once the warm-up is complete, it is time to begin the actual testing.

2. Participants then select a weight based on the previous effort which allows them to perform 3-repetitions (approx. 80% of predicted 1RM).

3. 1-minute rest (decided by test administrator).

4. Participants now increase the load and begin attempting their 1RM. A series of single attempts should be completed until a 1RM is achieved.

5. Rest periods should remain at 1-5 minutes between each single attempt and load increments typically range between 5-10% for the upper-body, and 10-20% for the lower-body exercises. 1RMs should be achieved within 3-7 attempts.

6. If multiple 1RM tests are being administered (e.g. back squat, bench press, and deadlift), then it is recommended that all test exercises should be separated by a 3-5 minutes rest period.

If a person does not feel comfortable with performing a 1RM test, then their maximal strength can be estimated based on how many repetitions they can perform with a submaximal weight. Sometimes coaches do not like to risk injury to their athletes and prefer estimating maximal strength which is also the case for inexperienced lifters or those with certain injuries or limitations.

**Day 5:** (22<sup>nd</sup> June, 2021): 1<sup>st</sup> Technical Session

**Speaker:** Mark Farrell

**Topic:** Need Analysis and Reverse Engineering in Football

He started his presentation with the concept of need of players. As players participate in different sports have specific requirement according to their sport and level of participation. Players have different requirement and that need to be assessed and fulfilled with adequacy on right time. Technical need analysis is prime requirement for players as players should be well equipped with correct skill. If player is posing wrong skill, in that case it may be injurious for him and it requires more energy in compare to others. So it is important for coach and manager that they should critically analyze the skill proficiency of players. Tactical need analysis is another aspect, as now days players are almost similar to others in respect to skill proficiency and fitness aspect. So good fitness is not the assurity to win the match. That's why it is important to work on tactical aspect. He revealed the secret of successful football players. In early phase of the match great players play very casual and try to understand the strategy of opponent team and they preserve their energy. Due to which it seems their team going to lose the match, but as match progresses towards its conclusion at that moment they show their efficiency and use their preserve energy to score the goal.

Psychological preparation is also important, that why it is done after complete exploitation of sports training and techniques. Because training methods, training loads, and methods of speeding up recovery used by leading athletes are very similar, based on the same widely accessible knowledge of physiology of effort, it is mental training that determines victory or defeat. Psychological preparation involves mental exercises, and methods, if systematically applied, improve control of emotions and behaviour, quality of concentration and increase endurance to stress or mental toughness. These preparations tightly integrated with physical training. Both these forms of preparing athletes for competition complement each other and lead to peak form and record results.

He also discussed about physiological need analysis which consist on Biodynamic, Bioenergrtics and Biomotor quality. According to him there are certain things which should be fixed like, Equipments, Staffing, Technology, Culture, Environment, Injury and Calander of players.

**Day 5:** (22<sup>nd</sup> June, 2021): 2<sup>nd</sup> Technical Session

**Speaker:** Mark Farrell

**Topic:** Planning Strength and Conditioning in Football Players

In this session resource person discussed about Planning Strength and Conditioning in Football Players. He discussed about strength training and explained that strength training should part of a comprehensive training program for football. He also emphasised on periodization of training as it breaks the year into three or four training phases, with each phase concentrating on a particular fitness development. Periodized programs provide a progressive build-up to peak fitness and performance. Each phase has different objectives and each successive phase builds on the previous one.

A year-round football weight training program could look like the program we've outlined below. When we use the term "football," we mean any of the body contact sports included in the introduction. If we mention something that doesn't apply to your sport, just modify it.

He also explained that in early pre-season, the foundation program encompasses a mix of endurance, strength, and hypertrophy objectives, which means that the weights are not too heavy and the sets and repetitions are in the range of 2 to 4 sets of 10 to 15 repetitions. In this phase, you build some strength, some muscle size, and endurance. In this phase, we should build strength. The fast and agile players should be careful not to bulk up too much. They should have a good foundation from early pre-season workouts and now the emphasis is on lifting heavier weights in order to train the nervous system in conjunction with the muscle fibers to move bigger loads.

**Day 6:** (23<sup>rd</sup> June, 2021): 1<sup>st</sup> and 2<sup>nd</sup> Technical Session

**Speaker:** Martin Gallyer

**Topic:** Exercise Categories and Exercise Selection

Martin Gallyer resource person of this session discussed about, exercise categories. As in sports and training there are numerous exercises and we should aware about their uses. Each and every exercise has

own specification and benefits as well as limitations. So a coach must be wise to use the available resource according to requirement of players. As there should be perfect mix of exercises according to need of players because exercise can be specific for strength endurance, power, explosive strength, maximum strength, speed agility, hypertrophy. So the selection must be according to goal of a player. He explained the concept with certain example like if a volleyball player is training for skill specific purpose in that condition exercise should be general fitness related and if the player is training for explosive strength in that case power oriented and explosive strength oriented exercise should be suggested.

He explained that there should be specific Periodization as it is a process of achieving top form at right stage of competition. As it helps in selection of exercises, deciding order of exercise, deciding load, deciding number of set per exercise, speed of movement, rest period.

#### **2.4 Panel Discussion:**

Last day of this workshop was devoted for participant's assessment and open discussion. In this session participants gone through performance analysis with the 30 MCQ based on the contents of workshop. The duration of the test was 30.min and almost 80% participants had submitted their responses within defined time frame, while rest took some extra time to submit, due to internet connectivity. After that there were some questions from the participants regarding the workshop contents, which was answered by available experts in that session.

#### **2.5 Valedictory Session:**

Faculty of Physical Education and Sports Sciences in Collaboration with IQAC, Rajiv Gandhi University concluded One Week Online Workshop on Assessment and Management of Strength on 24th June, 2021. In the beginning of valedictory session participants express their views about this workshop and they strongly recommended that this kind of workshop should be held on regular basis as strength and conditioning is its infancy stage in India and very less information is available about this domain, initiative taken by faculty of Physical Education and Sports Sciences, Rajiv Gandhi University is need of the hour. While some participants requested from Honourable Vice Chancellor of RGU that this kind of workshop should be hosted in physical mode by RGU after pandemic. According to some participants the key of this workshop was the online practical sessions in which participants also participated with their own equipments

and performed the activities in observation of experts. They learned about the scoring pattern for movement analysis that plays a vital role in preparation of the customized training programme.

Prof. Saket Kushwaha, Honourable Vice Chancellor of RGU, was the Chief Guest of this valedictory ceremony and he extend his warm greeting on successful organisation of this workshop, he shared his view on development of sports and rightly said latest knowledge and research is a key to success in sports so such kind of programme should be held at regular basis and he also assured that university will always continue to support sports training programme. He released the promotional video of Faculty of Physical Education and Sports Sciences.

Dr. Nabam T. Rikam, Registrar of RGU also assured that university will provide all supports for future activities of Faculty of Physical Education and Sports Sciences as it is only one kind of centre in this part of country.

Dr. Tadang Minu, HoD, Physical Education in her address appreciated the efforts of participants that they put during session. She also recognized the effort of Anand Date (Strength & Conditioning Coach at National Cricket Academy – BCCI), Martin Gallyer (Former Strength and Conditioning Coach of Cricket West Indies), Asia Joseph (Strength and Conditioning Coach at Florida International University), Mark Farrell (Performance Coach of Scottish Football Association) and Yogesh Dwivedi (Strength and Conditioning Coach, High Performance Centre, Sports Authority of Gujarat) to make this workshop a great learning experience.

Dr. Anil Mili, former HoD of Physical Education delivered valedictory lecture and expressed the relevance of sports science in achieving success at elite level. Dr. Vivek Kumar Singh in his vote of thanks extended his gratitude to university administration, participants, Dr. K. Rojeet Singh and Dr. Sambhu Prasad for their all support and motivation throughout the workshop.

## Part 3: Major Takeaways

### 3.1 Academic Context:

- Participants learned about Movement Competency and Initial Assessment of Athletes. They understand about a valid point that performance of player not only depends on movement assessment, there are certain other factors who determine the performance of players, but movement assessment can help the trainers to diagnose the need of their trainee players and provide training and exercise according to their requirement. Participants learned that what should be the ideal position during any activity. They learned to assess performance and assigned scores according to performance in practical session.
- There are numerous methods to assess the strength but the most reliable and widely used methods to assess strength like 1-RM test, 3-RM test, 5-RM test, REP Max Method, Percentage based Method were taught to learners. While participants learned about interpretation of Force Velocity Curve and use of different applications to measure the strength ability of players.
- Participants learned about management of athletes in weight room. As weight room is a place where athletes devote their time and energy so it is very important that there should be proper safety for the athlete along with the well trained coach. They understand the significance of CPR expert in weight room because during session any kind of injury may occur and specifically when players are lifting too heavy weight. They learned that there should be guideline and protocol for the players as well as training staffs in weight room.
- They learned in weight room for better management of athletes they can be divided in different training groups based on; events, strength level, need of players or team, level of participation. They also learned about different strategies for different goals. Like for training camp, clinical session and visiting session there should be different strategies.
- Trainers and players have misconception about introduction of plyometric training in case of young athletes, participants learned that with appropriate protocol and proper observation Plyometric can be introduced to young athletes also. They got to know that whether weight training should be

assigned to female athletes or not. Participants learned that if strength training is assigned to female players it will help them in many ways, like it will reduce chances of injury, increase bone mineral density among them and it may strengthen the concern skeletal muscles.

### **3.2 Research Context:**

- If there are not appropriate equipments for strength training, than what should be the ideal set-up or minimum essential equipments to fulfil the need of trainee players.
- Experts have misconception about introduction of strength training for young athletes. It should be investigate that what are the possible drawbacks of introducing strength training in early age.
- It should be also investigated that which modality of strength training can be introduced with young athlete and with which intensity.
- As earlier literatures are suggesting that in case of females, strength training should be avoided, than what are the sports where introduction of strength training can be injurious and is there any health condition which can cause problem.
- Aquatic Plyometric training can be a modality of interest for athletes as it provide different short of experience.

### **3.3 Policy Making and Practice Context:**

- Strength and Conditioning course is early stage of India. It should be promoted by government of Indian as well physical education institutions of India.
- Sports authorities should assign one well competent Indian S&C coach with a foreign expert.
- Indian institutes should collaborate with organisations like ASCA, UKSCA, CSCA and others for curriculum development and orientation of teacher with help of their experts.
- Practical based workshop with well trained experts should be held every year to improve the concept of strength training in Indian S&C coaches.



## Part 4: Appendices & Annexure

### Annexure 1

#### Programme Schedule

#### ONE WEEK ONLINE WORKSHOP ON

#### **"ASSESSMENT AND MANAGEMENT OF STRENGTH"**

Organized by

Faculty of Physical Education and Sports Sciences

*(A Centre of Excellence on Sports Science Education and Research)*

In Collaboration with IQAC,

Rajiv Gandhi University, Arunachal Pradesh

<b>MINUTE TO MINUTE PROGRAMME SCHEDULE OF INAUGURAL CEREMONY</b> <b>18<sup>th</sup> June, 2021</b>	
<b>Welcome Address by Dr. Tadang Minu, Head, Department of Physical Education</b>	<b>2.20 PM</b>
<b>Words by Prof. R. C. Parida, Chairman, IQAC, RGU</b>	<b>2.25 PM</b>
<b>Words by Dr. Nabam T. Rikam, Registrar, RGU</b>	<b>2.30 PM</b>
<b>Words by Prof. Amitava Mitra, Pro- Vice Chancellor, RGU</b>	<b>2.35 PM</b>
<b>Address by Chief Guest: Prof. Saket Kushwaha, Hon'ble Vice Chancellor, RGU</b>	<b>2.40 PM</b>
<b>Vote of Thanks by Dr. K. Rojeet Singh Singh</b>	<b>2.50 PM</b>



ONE WEEK ONLINE WORKSHOP ON  
**"ASSESSMENT AND MANAGEMENT OF STRENGTH"**



Organized by

Faculty of Physical Education and Sports Sciences

(A Centre of Excellence on Sports Science Education and Research)

In Collaboration with IQAC,

Rajiv Gandhi University, Arunachal Pradesh

## Tentative Schedule of Workshop

Date	Keynote Address	
<b>Day 1(18/06/2021)</b>  03.00 PM to 03.45 M	<b>Keynote Address on: Strength and Conditioning Nuances and Indian Sports Science Eco-System</b>	
	<b>Mr. Anand Date</b> Strength and Conditioning Coach at National Cricket Academy, BCCI	
Date	Session-I (4.00PM to 5.30PM)	Session-II (5.45 PM to 7.15 PM)
<b>Day 1</b> (18/06/2021)	<b>Martin Gallyer:</b> Movement Competency and Initial Assessment of Athlete	<b>Martin Gallyer:</b> Movement Competency and Initial Assessment of Athlete
<b>Day 2</b> (19/06/2021)	<b>Yogesh Dwivedi:</b> Components of Strength	<b>Yogesh Dwivedi:</b> Assessment of Strength
<b>Day 3</b> (20/06/2021)	<b>Mark Farrell:</b> Need Analysis of Strength in Elite Sports	<b>Mark Farrell:</b> Planning of Strength Training in Players busy Calendar
<b>Day 4</b> (21/06/2021)	<b>Martin Gallyer:</b> Practical: Strength Assessment	<b>Yogesh Dwivedi:</b> Practical: Programme Designing based on Result
<b>Day 5</b> (22/06/2021)	<b>Asia Joseph:</b> Management of Athletes in Weight Room	<b>Asia Joseph:</b> Creating Performance Environment
<b>Day 6</b> (23/06/2021)	<b>Martin Gallyer:</b> Exercise Categories and Exercise Selection	<b>Martin Gallyer:</b> Programme Designing and Monitoring
<b>Day 7</b> (24/06/2021)	<b>1. Reassessment</b> <b>2. Feedback</b>	<b>Valedictory Session</b>



ONE WEEK ONLINE WORKSHOP ON  
"ASSESSMENT AND MANAGEMENT OF STRENGTH"



Organized by  
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Rajiv Gandhi University, Arunachal Pradesh

MINUTE TO MINUTE PROGRAMME SCHEDULE OF VALEDICTORY  
CEREMONY

24<sup>th</sup> June, 2021

Welcome Address by Dr. Tadang Minu, Head, Department of Physical Education	5.00 PM
Feedback by Participants of Workshop	5.05 PM
Valedictory Address by Dr. Anil Mili, In-Charge, Department of Sports Psychology	5.15 PM
Words by Dr. Nabam T. Rikam, Registrar, RGU	5.25 PM
Release of Promotional Video by Prof. Saket Kushwaha, Hon'ble Vice Chancellor, RGU	5.30 PM
Address by Chief Guest: Prof. Saket Kushwaha, Hon'ble Vice Chancellor, RGU	5.35 PM
Vote of Thanks by Dr. Vivek Kumar Singh	5.45 PM

## Annexure 2 List of Participants

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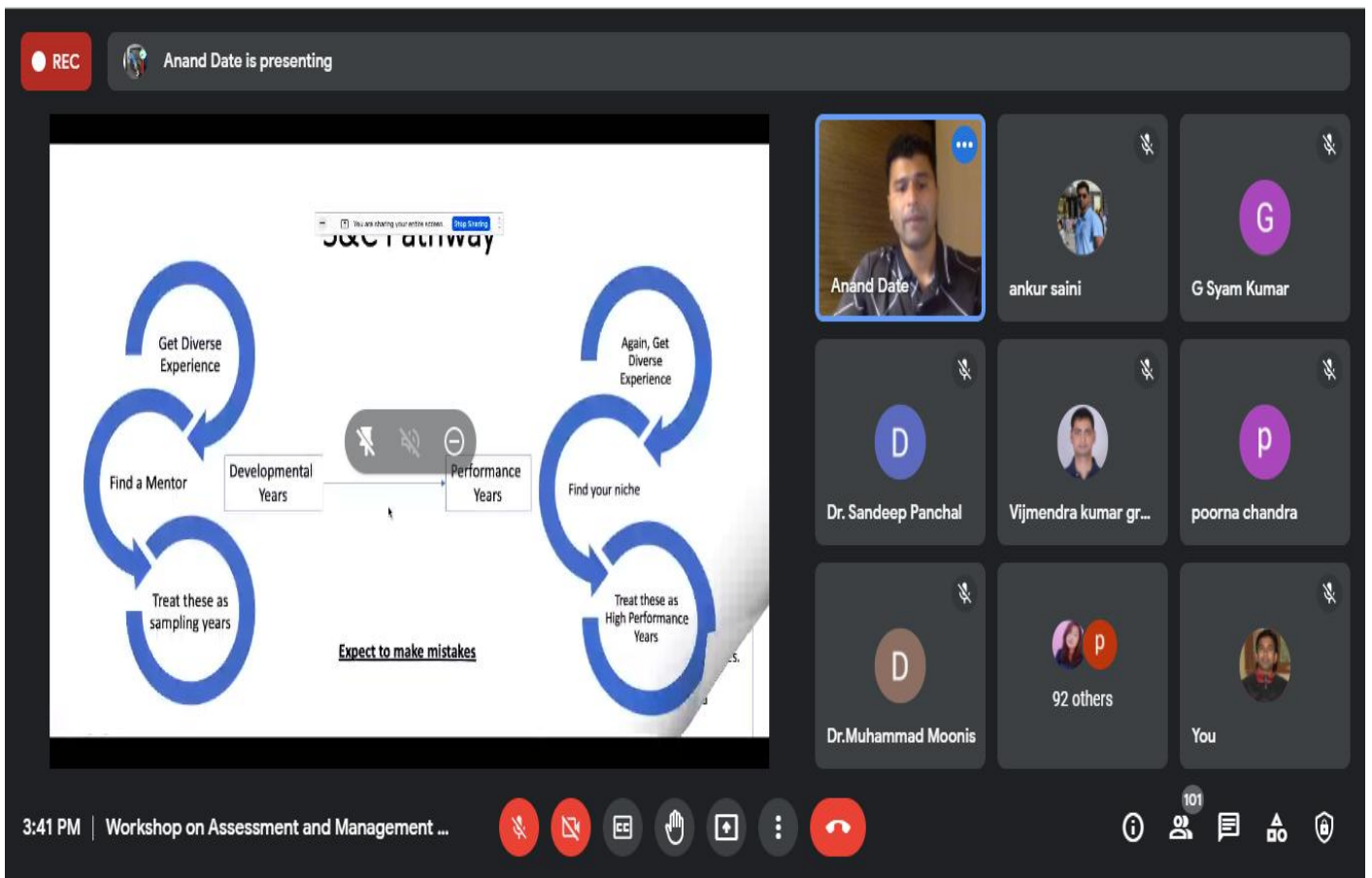
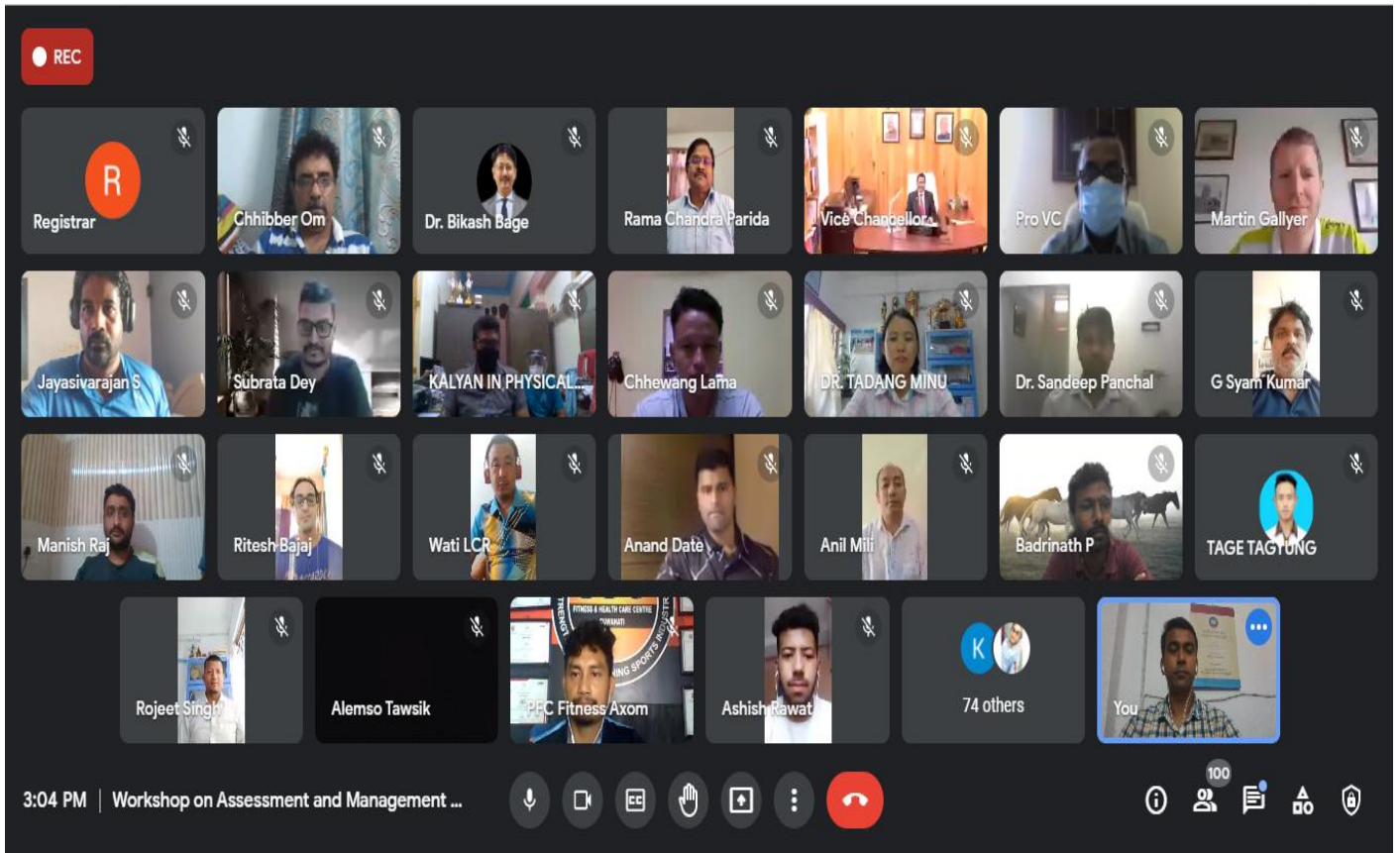
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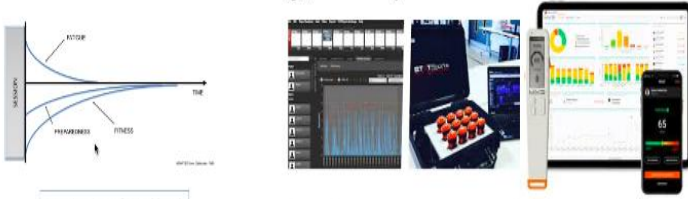
# Annexure 3 Photographs



REC

Anand Date is presenting

# Aim to Achieve Optimal Physical State of Athlete Pre-Training / Competition



Monitoring of Workload

Proposed Fielding Session Intensity Descriptors

Intensity level	Drills Specifications
Easy Session	No throwing, no COD, limited ball skills target, Coaches, Warm, Stamina, Break, Physical, Fielding- Time Limit of 15
Medium Game or	Number of Throws (T), Number of COD (C), Speed Ball Skills - Time Limit of 15
Hard Game or	Number of Throws (T), Number of COD (C), Speed Ball Skills - Time Limit of 15
Overkill or Breaks	Number of Throws (T), Number of COD (C), Speed Ball Skills - Time Limit of 15

Collaboration with Coaches

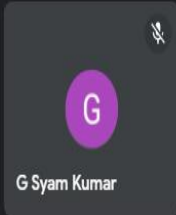
Use of Technology



Anand Date



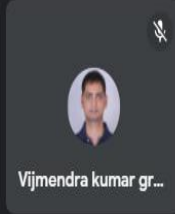
ankur saini



G Syam Kumar



Dr. Sandeep Panchal



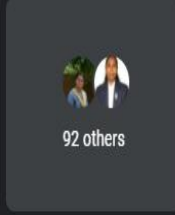
Vijendra kumar gr...



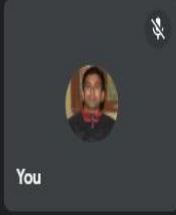
Dr. Muhammad Moonis



palpasha gurung



92 others



You

5:58 PM | Workshop on Assessment and Management ...



REC

Martin Gallyer is presenting

# #1 Are they healthy enough to exercise?

Ideally more detailed:  
• Doc / Physio Clearance  
• And full injury history

If not then:  
• PARq including declaration of injury history

If they are not 'passed' here then do not progress to #2 – MUST GET CLEARANCE  
• Doc clearance  
• Self-declared



When football teams sign a player, Player has arrived at X club to 'have a medical'

## UTT Community Gym Exercise Readiness Assessment

UTT

Question	Circle answer	If answered 'NO', please explain:
1. Do you feel you are fit and healthy enough to exercise?	YES / NO	
2. Do you have any medical conditions that may affect your ability to exercise?	YES / NO	
3. Do you have any injuries that may affect your ability to exercise?	YES / NO	
4. Do you have any other conditions that may affect your ability to exercise?	YES / NO	

**Declaration**

I hereby declare that I am fit and healthy enough to exercise and I understand the risks involved in participating in physical activity. I have read and understood the terms and conditions of the assessment and I agree to participate in the assessment.

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

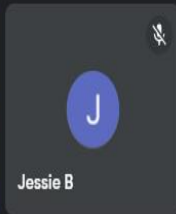
**UTT Staff Comments:**

Should the doctor/physiotherapist be able to sign off on the assessment? YES / NO

Should the doctor/physiotherapist be able to sign off on the assessment? YES / NO



Martin Gallyer



Jessie B



Vice Chancellor



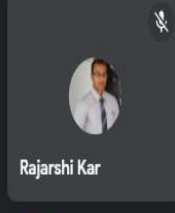
Dr. Om Prakash Mish...



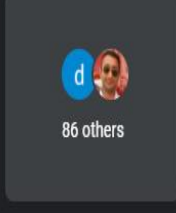
KALYAN IN PHYSICA...



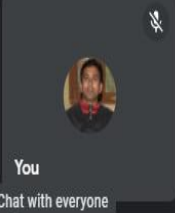
ankur saini



Rajarshi Kar



86 others



You

Chat with everyone

4:33 PM | Workshop on Assessment and Management ...



REC crick 1990 is presenting

# AUTOREGULATION

A FRAMEWORK THAT FACILITATES THE DAILY FLUCTUATIONS OF THE ATHLETE'S FITNESS STATUS WITH APPROPRIATE CHANGES TO THE PRE-PLANNED ROUTINE.

TOO FAST= INCREASE LOAD

IDEAL VELOCITY RANGE

Too Slow = Lower the Weight

6:17 PM | Workshop on Assessment and Management ...

Participants: crick 1990, 913 Shubham ra..., KALYAN IN PH..., Vaibhav Rai, John Lama, Vijay Sasidharan, Chingkhei Sorai..., 53 others, You

REC Shaiann Charles is presenting

# TEAM BONDING IDEAS

- CREATE CHALLENGES DURING PRACTICE
- TEAM CHANTS
- DEVELOP CULTURE
- INFORMAL GROUP SESSIONS - DINNER, BOWLING, SKATING, WATCHING GAMES TOGETHER
- ATTENDING WORKSHOPS
- GROUP ASSIGNMENTS DURING MEETINGS

6:53 PM | 3rd Day of Workshop on Assessment and Ma...

Participants: Shaiann Charles, khagemba ningthou, Rishabh Lakhera, dharmendar pratap ..., Mukeish Chauhan, Dr. Manender Naidu ..., Dr. Pawan Singh, 43 others, You





State News

## Latest knowledge & research key to success in sports: RGU VC

June 25, 2021



**ROHO HILLS, 24 Jun:** Latest knowledge and research are key to success in sports, said Rajiv Gandhi University (RGU) Vice Chancellor Prof Saket Kushwaha in his address during the valedictory function of the weeklong virtual workshop on 'Assessment and management of strength' on Thursday.

Commending the organizers of the workshop, the VC gave assurance that the university would continue to support sports training programmes.

"Such kind of programme should be held on a regular basis," he added.

Poll

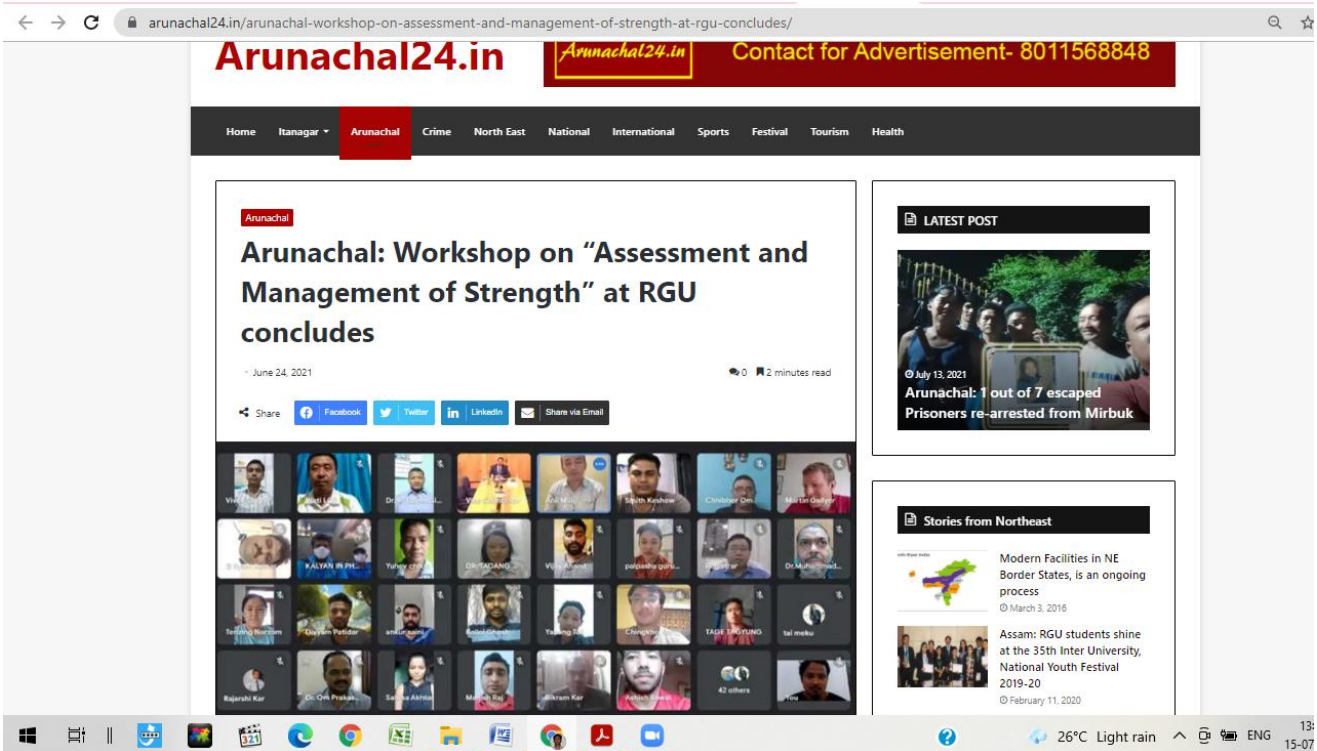
People in the Itanagar capital region should strictly observe Covid-appropriate behaviour in order to avoid another lockdown.

Agree

Disagree

Comments

Comments box



## Annexure 4: Media Coverage

1. <https://arunachal24.in/arunachal-workshop-on-assessment-and-management-of-strength-at-rgu-concludes/>
2. <https://www.nyoooz.com/news/arunachal-pradesh/1588662/arunachal-workshop-on-assessment-and-management-of-strength-at-rgu-concludes/>
3. <https://arunachaltimes.in/index.php/2021/06/25/latest-knowledge-research-key-to-success-in-sports-rgu-vc/>
4. [http://echoofarunachal.in/news\\_details.php?nid=12707](http://echoofarunachal.in/news_details.php?nid=12707)
5. <https://thedawnlitpost.com/2021/06/weeklong-online-workshop-on-assessment-of-strength-concludes/>
6. <https://independentreview.in/2021/06/24/online-workshop-coaches-trainers-concludes/>
7. <https://arunachaltimes.in/index.php/2021/06/19/workshop-on-strength-mgmt-underway/>
8. <https://twitter.com/rgu1984/status/1408329197676756992?s=24>