Sports Authority of India New Delhi

Syllabus For The Coaches Knowledge Upgradation Course in Sports Sciences 2020

Chapter	Topics	Unit
1	**Physical and Physiological changes in growing athletes** Structural and functional changes during the rapid growing spurt in adolescence. Various Challenges in training and recovery during the rapid growing spurt and attention of the Coaches and support staff to avoid injuries and improve performance.	1
2	**Various Assessment & their importance** Various field and laboratory testing , its types & frequency , Need for testing of athletes. Basic consideration for conducting field tests. Administering various Basic tests of Speed, Power, Endurance, Flexibility ,Agility & Balance . Importance of Basal heart rate monitoring. Various tests for High performance athletes.	
3	**Resistance Training** Resistance Training , it's definition ,uses. Various Modalities of Resistance Training ,their Advantages and Dis-advantages, Viz. a) own Body weight. b)Partner Resistance. c)Free Weight. d) Machines. e) Medicine Ball. f) Elastic TheraBand. g) Movement Specific resistance device. h) Strength Implements. I) Water & Environmental Resistance Training Various Principles of Resistance training: a)Principles of Overload, ,b)Principles of Progression, c)Principles of Specificity. d)Principles of Variation. e)Principles of Individualization. f)Principles of diminishing return .g) Principles of reversibility.	2
4	**Designing a Resistance Training Programme** Exercise Prescription ,Concept. Consideration for framing Exercise prescription, Components of Strength training .a) Need analysis ,b) acute programme Variables c)Cronic Programme Manipulation d)Administrative concerns.	
5	**Periodization of Strength Training**	

	Objective of Periodization. Logical and progressive preparation of a strength training programme. Volume and intensity of manipulation, dividing a year into training periods, dividing the loads as per requirement of the specific period. Models; linear or classical Modal and Non linear or Undulating Model. Bompa's Model of Periodization, a) Anatomical Adoption. b)Hypertrophy/muscular Endurance. c)Maximum Strength. d)Conversion. e)Maintenance. f)Transition. Fitness training models .a) Stability and Mobility Training. b)Movement Training. c)Load Phase. d) Performance Training.	
6	**Strength & Conditioning** Training & Performance, designing training programme for high performance athletes	**2**
7	**Sports Injuries & Rehabilitation** **Injuries on Field of Play and how to avoid them** Basics of injury prevention, Athletes Concussion. Head injuries, ,Stress Fracture, Heal pain in adolescents, mid foot pain Their immediate action ,short and long term treatment. Rowers Chest Pain. Rib stress fractures injuries of para athletes. Activities after Recovery.	**3**
8	**Soft tissue injuries** . Meaning , Risk factors and prevention from soft tissue injuries. Types of Soft tissue injuries. Acute Injuries, Leg Cramps, its causes and treatment. Delayed onset of Muscular soreness(DOMS) Its treatment. Bruise (Direct impact),symptoms & treatment. Sprain & Strain Cause ,Symptoms & Treatment (POLICE) & Avoid (HARM).	
9	**Load management and injury prevention among young athletes**.	

	Age and maturity related variations during the adolescent phase. Difference between biological age and muscular skeletal age. Long term Athletic Development(LTAD)plan, Factor influences LTAD. Structure of training for young athletes:-a)Learn to train(8-12years), b)Train to train(12-15yrs.).c)Train to Compete(15-18yrs).d)Train to win (18yrs.+).	
10	**Sports Injuries with special relevance to Team Games** Concept of Injury Prevention, Recovery & Importance of Base line assessments & periodic Medical assessment. Intrinsic & Extrinsic Risk factor of Injuries. Delicate balance between Load & Recovery. Understanding recovery , Massage, Cold water immersion, Contrast bath, Rest ,Sleep Hygiene Strategies. Micronutrient Cartilage Supplement. Injury Prevention Plans; Hamstring, Ankle, ACL & SLAP.	
11	**Basic Sports Nutrition:** Understanding the uses of carbohydrates, proteins, fats , minerals and vitamins and their breakdown forms. Sources for protein for vegetarian & Non-vegetarian. Micronutrient Ratio, Calories. Body Weight maintenance/loss/gain through input & output of Calories. Water soluble & Fat soluble Vitamins. Minerals(Major & Tress),Importance.	**4**
12	**Understanding Blood tests and Body measurements to guide athlete's Diet**. Resting Metabolic Rate (RMR) Calculation of RMR of Athlete. Burning of Calories. Influence of Fat & Muscles in RMR. Important Blood parameters of Athletes. Iron testing , Food to include & avoid for the high & low Iron percentage. Importance and method of Body Composition test.	
	Nutritional Supplements & Uses. Definition & objective of intake ,when to take , Deficiency . How to proceed to intake of Food Supplements. phase -1(Deficiency ,symptoms, training),Phase -2 (Consultation & Safety) & Phase-3 (gradual progression & Supplement free zone). Action ,Recommendation & Caution of Supplement intake of Whey Protein, Casein, Vegan , BCAA, L-Glutamine, Sports Drinks, OMEGA 3, Creatinine, Multi-vitamin, HMV, Beta ALENINE, ZMA(Zinc Magnesium Aspartate).	

13	**Sports Psychology: Stress Management** Understanding the Mind- Body connect to Stress, Neuroscience the cutting-edge technology to combat Stress, Coping Mechanism for Stress Management.	**5**
14	**Motivation & Self Determination** Relates to self-determination, different self-exercise areas , Emotional support, Information support, Esteem support, Tangible support.	
15	**Positive Coaching** Communication, Coach- Athlete relationship, being sensitive to learning styles, Understanding different personality types of athletes.	
16	**Biomechanics** Techniques & Bio Mechanics. Key biomechanical ways of athlete analysis including video analysis, Force platform jump tests, new wearable bio mechanical devices	**6**
17	**Theoretical Insight into Running Mechanics** Why analyzing running mechanics, factors affecting running mechanics, external forces acting on body, brake force and injury, arm action, coordination and core strength, bilateral muscle imbalance	
18	**Technical Analysis** & **Prevention of Injuries**. Anterior Knee Pain (Patellar Tendonitis) Management and Modification in Bike Fitting for a Track Cyclist. Bike fitting, measurements in bike, injury prevention.	
20	**Mechanics of Injury** Technique correction in sports events for better technique and prevention of injuries, use of technology in identification and prevention of injuries	
21	**Sports Anthropometry** Growth and Maturation in Athletes. What is growth & amp; maturation, significance of growth and maturation in sports, various methods of studying maturation, estimation of maturation in a simplistic way. Relationship of chronological	**7** **7**

	age, biological age and accelerated adaptation to training. LTAD program /sports specific training cycle. Talent Identification , selection and developmental pathways in India	
22	**Sports Physiology** Physiology of Strength Training - Basic terminologies; basic sports physiology, Physiological adaptation to strength training. Physiological basis of strength training program. Strength training & peak sports performance. Medical aspects of strength training. Concept of over-training vs overreaching & supercompensation: how to identify common illness related with faulty strength training, blackout during lifting, acute cardiovascular response etc. Common injuries related with faculty strength training. Basics on Sports & Exercise medical use of strength training.	
23	**Doping:** Doping & it's Hazards. How to prevent young Athletes from Doping.	