

Appendix 7.1



SOMAIYA
VIDYAVIHAR UNIVERSITY

Somaiya Sports Academy

Draft_Syllabus

**Post Graduate Diploma in Strength
and Conditioning**

**From
Academic Year 2025-26**

Version-1

Somaiya Sports Academy

Somaiya Vidyavihar University, Mumbai - 400077

Preamble:

For those with an interest in pursuing a career in the field of strength and conditioning, this coursework - Diploma program empowers individuals to be specialized or broaden learner's expertise.

Course will attract Physical education teachers, coaches, athletes and sports science research, as well as experts in the field from within and outside SVU, to provide learners with contemporary knowledge and skills. Individuals will have a broad spectrum of various contents and literature covering sports training ,sports coaching, biomechanics, exercise physiology, sports psychology, sports specific fitness, conditioning, sports injuries, and sports performance analysis. This one year diploma program will lead to a career in high performance sports or allow established professionals to up skill and update their sports science knowledge.

Duration:

One Year

Fees:-

Rs 132400/-

Facilitator:-

Masters of Sports and Exercise Science or Masters of Physical Education or Strength and Conditioning from a recognized university with minimum 60% and a relevant teaching experience of 3-5 years in similar subjects. Preferably a sports man with national or international participation.

Eligibility for admission:

- **Any Graduate with prerequisite in strength and Conditioning from a reputed Institution(NSCA,ACSM,INSCA,ISSA or IUSCA)**

OR

- **Any Graduate with prerequisite in sports(State,National or AIU participation)**

**Post Graduate Diploma in Strength
and Conditioning Semester Credit
Scheme**

Course Code	Course Name	Teaching Scheme (Hrs.) TH – P – TUT	Total Hrs.	Credits Assigned TH – P – TUT	Total Credits
DPSC34101	Anatomy and Physiology for Strength and Conditioning	3 – 2 – 1	06	3 – 2 – 1	06
DPSC34102	Principles of Strength and Conditioning	3 – 2 – 1	06	3 – 2 – 1	02
DPSC34103	Science of Strength and Conditioning	3 – 2 – 1	06	3 – 2 – 1	06
DPSC34104	Return to sports	3 – 2 – 1	06	3 – 2 – 1	06
DPSC34105	Nutrition for Athletic Performance	3 – 0 – 1	04	3 – 0 – 1	04
DPSC34106	Dynamics of Program Design	3 – 0 – 1	04	3 – 0 – 1	04
Total		18 – 08 – 6	32	18 – 08 – 6	32

Examination Scheme

Course Code	Course Name	(IA)	ESE	Practical or Oral	Total
DPSC34101	Anatomy and Physiology for Strength and Conditioning	25	50	25	100
DPSC34102	Principles of Strength and Conditioning	25	50	25	100
DPSC34103	Science of Strength and Conditioning	25	50	25	100
DPSC34104	Return to sports	25	50	25	100
DPSC34105	Nutrition for Athletic Performance	25	50	25	100
DPSC34106	Dynamics of Program Design	25	50	25	100
Total		150	300	150	600

Marking Scheme:

Note:

- (a) Theory (Th) period is equal to 1 hour duration.
- (b) Practical (P) period is equal to 2 hours duration.
- (c) Tutorial (T) is equal to 1 hour duration.

Marking Scheme:

Maximum Marks = 100

Theory Examination = 50 Marks

Practical Examination = 25 Marks

Internal Assessment = 25 Marks

Internal Assessment (Maximum Marks – 25)

Tutorial = 20 Marks

Attendance = 5 Marks

Instruction for Examiners / Paper Setters Setting Paper for 50 Marks:

The Examiner is required to set paper of 80 Marks with necessary choice as follows:

The Examiner is required to set Question No. 1 from all (06) subjects carrying a total of 10 Marks each. Question No. 2 from 3 subjects with 6 credits carry a total of 10 Marks. Question No. 3 from 3 subjects with 4 credits carry a total of 10 Marks each.

- Question No. 1 will have 60 questions of 2 Marks each.(any 15 questions) 30marks
 - Question No. 2 will have 10 questions of 1 Marks each. 10 marks
 - Question No. 3 will have 10 questions of 1 Marks each. 10 marks
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Marking Scheme for Attendance: (05 Marks)

90% and above	5 Marks
80 – 89%	4 Marks
70 – 79%	3 Marks
60 – 69%	2 Marks
50 – 59%	1 Mark
Less than 50%	0

Marking Scheme for Practical of 50 Marks:

The Practical Examination will be conducted in 4 Heads by an External as well as an Internal Examiner.

Administration (Execution / Playing) Ability	10 Marks
Examiners Choice 1	10 Marks
Examiners Choice 2	10 Marks
Students Choice	10 Marks
Record Book	10 Marks
Total	50 Marks

SYLLABUS

Paper:- 1

DPSC34101	Anatomy and Physiology for Strength and Conditioning	60 Hours
TH – P – TUT		3 – 2 – 1

Objective	· Use knowledge of anatomy and physiology to teach proper movement mechanics and technique in sports and physical activities. · Correct faulty movement patterns to enhance performance and reduce injury risk. · Develop strength and conditioning programs tailored to the developmental stages of children, adolescents, and young adults.
Learning Outcome	· Design safe and effective strength and conditioning programs based on anatomical and physiological principles. · Tailor programs to meet the needs of different populations, including youth, athletes, and individuals with specific limitations. · Demonstrate an understanding of the energy systems used during various types of physical activity. · Explain the body's acute and chronic physiological responses to exercise, including muscular, cardiovascular, and nervous system adaptations.

Unit-1:- Anatomy and Physiology in Strength and Conditioning

* Structure and Function of the Skeletal, Muscular and Nervous System

*Structure and Functions of Respiratory and Circulatory system.

*Kinesiology of the Upper Body – Shoulder Complex, Elbow, Wrist & Hand, Spine & Trunk, Abdomen & Core

*Kinesiology of the Lower Body – Pelvis & Hip, Knee, Ankle & Foot

*Biological Adaptations to Aerobic & Anaerobic Exercises Cardio respiratory Adaptations to Aerobic Training & Anaerobic Training

*Musculoskeletal Adaptations to Aerobic Training & Anaerobic Training

*Hormonal Adaptations to Aerobic Training & Anaerobic Training

Unit 2: Bioenergetics and Metabolic Conditioning in Strength and Conditioning

*Bioenergetics of Exercises Training

*Substrate Depletion & Repletion and Exercise Intensity

*Metabolic Specificity of Training and Performance

* Protein Synthesis & Carbohydrate Break down

* Glycogen & lactate formation

*Energy demands and training phases

Practical:-

- (i) Traditional and Modern technology of measuring Heart Rate.
- (ii) Measurement of Blood Pressure.
- (iii) Study of various bones of the human body.
- (iv) Study of the various systems with the help of models.
- (v) Study of various movements of the joints.

Recommended Readings:-

1. Moried EN (2007). Essential of Human Anatomy & Physiology, Ed 8th Dorling Kindersley, India.
2. Prives M & Others (2004), Human Anatomy, Vol I & II Paragon, Delhi.
3. Seeley & Others (2008) Anatomy & Physiology, McGraw Hill, Boston.

Paper:- 2

DPSC34106	Principles of Strength and Conditioning	60 Hours
TH – P – TUT		3 – 2 – 1

Objective	To provide advance knowledge of Strength & Conditioning, and to familiarize the students with various aspects of weight training exercises and aerobic training philosophy for various sport athletes.
Learning Outcome	Students acquire the knowledge of history & foundations of Strength & Conditioning and understand the various components of Strength & Conditioning.

Unit-1:-

- Exercise techniques, fundamentals of spotting and positioning, understanding necessity of strength and conditioning program. Training adaptations, (SAID) Specific Adaptations to Imposed Demands. Energy sources and systems.
- Safety in movements and executions, expertise, safety, and awareness from surrounding, rules of exercise selection and prescription.
- Principles of sports training, annual plans, Periodization in training program, training cycle. Training load, training prescription.
- Warm - up and stretching, types of warm - ups, components of warm - up, stretching during warm - up, post warm - up, myofascial release, techniques of using equipment for myofascial release.

Unit 2:-

- Components of Fitness and conditioning program design.
- Individual and team training programs are designed for high performance. Principles of Training Program Design.
- Understanding the various Training variables, performance variables and their program design. Factors affecting training program design.
- Steps in training program design and its shortcomings.
- Basic designing, monitoring, reviewing, and evaluating exercises training program, strength training, plyometric training, speed training, agility training programs and design.

Recommended Practicals:-

- Warm-up and Mobility drills
- Strength Assessment Test

- Speed and agility Drills
- Plyo-metric and Power Training
- Endurance and Conditioning Drills
- Movement and Bio-mechanical analysis
- Recovery and Regeneration techniques

Recommended Readings:-

1. NSCA's Exercise Technique manual for Resistance training, 3rd edition
2. Exercise Physiology, 8th edition by authors - William D mcardle, Frank I Katch, Victor L Katch
3. Physiology of Sport and Exercise, 7th edition by authors - W. Larry Kenney, Jack H. Wilmore, David L. Costill
4. ACSM 's Foundations of Strength Training and Conditioning

Paper:- 3

DPSC34103	Science of Strength and Conditioning	60 Hours
TH – P – TUT		3 – 2 – 1

Objective	To understand the scientific techniques and methods of strength conditioning to enhance performance.
Learning Outcome	The learner will be well equipped to design effective training program with scientific principles of exercise sciences.

Unit-1:-

- Evidence Based Practice of Strength and Conditioning for Sports Performance
- Program Design for Warm-Up/Cool-Down, Flexibility. Mobility and Stability Training
- Program Design for Anaerobic and Aerobic Endurance Training
- Program Design for Alternative Modes and Nontraditional Implement Training

Unit 2:

- Principles of Biomechanics Applied to Resistance Training
- Biomechanics of Human Strength & Power
- Role of Biomechanics in Athletic Performance & Minimization of Injury

- Bio mechanical principles: Principles of initial force, principles of optimum path of acceleration, principles of conservation of moment and principles of counter action.

Practical:-

Demonstration of planes & axes of a given movement

i) Determination of the location of muscles at various joints

ii) Shoulder girdle, Shoulder joints, Elbow joint

iii) Hip joint, Knee joint, Ankle joint

Muscular analysis of the techniques of game of your specialization

Determination of center of gravity of a Bat/Racket (Suspension method)

Evaluation of a Dynamogram to draw a velocity time curve, distance time curve.

Recommended Readings:-

1. Hamill, J. and Knutzen, K.M. (2003). Biomechanical Basis of Human Movement. Lippincott Williams and Wilkins, USA.
2. Hay (1993). The biomechanics of sports techniques. Prentice Hall Inc. New Jersey.
3. McGinnis, P. (2004). Biomechanics of Sports & Exercise. Human Kinetics, USA.

Paper:- 4

DPSC34104	Return to Sports	60 Hours
TH – P – TUT		3 – 2 – 1

Objective	To impart the knowledge about the various physical postures, athletic care and first aid in case of sports injuries and rehabilitation.
Learning Outcome	The learner will learn the science of posture, athletic care and first aid in case of sports injuries and rehabilitation. Such core knowledge and skills help to create a strong foundation for to correct different postures, athletic care and first aid, especially persons with special needs.

Unit-1:-

- Evidence Based Principles of Rehabilitation and Reconditioning
- Types of Injury & Phases, Managing the Athlete,
- Role of Sports Nutrition and Psychology in Injury Rehabilitation

- Rehabilitation – Aim and Objective, Recovery (Ice Bath, Contrast Bath, Hot Fermentation)

Unit 2:

- Sports Medicine and Athletic Care: Concept, Significance, Factors Causing Injuries & General Principles of Injury Prevention.
- Common Sports Injuries (Strain, Muscle and Ligament Sprain, Frozen Shoulder, Lower Back Strain, Tennis & Golfer's elbow, Runner's Knee, Shin Pain (Splint), Blister, Concussion, Abrasion, Laceration, Hematoma, Fracture, Bone & Muscle Dislocation)
- Rehabilitation plan for game readiness and exercise readiness.

Recommended Practical:-

- Baseline Assessment and screening(FMS,1RM,T-Test,YO-YO,Y-test)
- Mobility and Flexibility Restoration
- Strength and Stability training
- Plyo-Metric and Explosive Movement
- Speed, Agility and COD Drills
- Sports-Specific Conditioning
- Injury Prevention & Recovery Strategies

Recommended Readings:-

1. ACSM'S Guideline for Exercise Testing and Prescription (2001), American College of Sports Medicine, New York, U.S.A.
2. Anspaugh, D J., G. Ezell and K.N. Goodman (2006) Teaching Today Health, Mosby Publishers, Chicago (USA).
3. Beotra, Alka (2001-02) Drug Education Handbook on drug Abuse in Sports, Applied Nutrition Sciences, Mumbai.

Paper:- 5

DPSC34105	Nutrition for Athletic Performance	48 Hours
TH – P – TUT		3 – 0 – 1

Objective	To equip the students in sports and exercise nutrition practices that involve works on supplement, hydration strategy and overall health.
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Learning Outcome	After completing this course, the students will be able to Understand Sports Nutrition, balance diet, macro and micro nutrients Metabolism and fluid requirement Sports Specific Nutritional Requirement Understand Carbohydrate loading
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Unit-1:-

- Energy intake and Energy expenditure, Energy requirements for athletes, Calorific value of food
- Basal Metabolism, Thermal Effect of Food
- Maintenance of fluid and electrolyte balance , Hydration, dehydration and electrolyte imbalance.
- Classification, Sources, and requirements of Macro & Micro nutrients.

Unit 2:

- Nutritional Requirements for team sports, Nutrition for Track and Field athletes, Racket Sports, Nutrition for Endurance sports, strength and power athletes
- Carbohydrate loading, Pre & Post, during competition/training diet.
- Traditional method of measuring BMI, BMR, BIA and WHR.
- Ergogenic Aids in sports

Recommended Readings:-

1. Reaburn, P. R. (Ed.). (2014). Nutrition and Performance In Masters Athletes. CRC Press.
2. Ryan, M. (2012). Sports Nutrition for Endurance Athletes. Velo.

Paper:- 6

DPSC34102	Dynamics of Program Design	48 Hours
TH – P – TUT		3 – 0 – 1

Objective	To provide introduction and insights into designing the Strength & Conditioning program for various athletes, considering the physical demands imposed by different sports. Understanding the concepts of Speed, Agility & Quickness (SAQ) and Plyometrics training
Learning Outcome	Students will acquire the basis knowledge of designing the Strength and Conditioning program for beginner and intermediate level athletes for different sports.

Unit-1:-

- Concepts and program designs as per Periodization.
- Concepts and program design of Speed, Agility & Quickness (SAQ)
- Understanding the various SAQ drills and their relevance for various sports
- Strength and Conditioning for Female and Male Athletes
- Strength and Conditioning for Individual Sports and Team Sports

Unit 2:

- Understanding and designing complete program for off-season athlete
- Understanding and designing complete program for in-season athlete
- Program discussion for well know Indian sports like Cricket, Kabaddi, Badminton etc
- Workload Monitoring and Athlete Management
- Priming for Competition and Recovery Strategies for Athlete

Recommended Readings:-

1. Exercise Physiology, 8th edition by authors - William D McArdle, Frank I Katch, Victor L Katch
2. ACSM 's Foundations of Strength Training and Conditioning
3. ACSM 's Guidelines for Exercise Testing and Prescription - 10th edition