



**SPORTS AUTHORITY OF INDIA
NETAJI SUBHAS NATIONAL INSTITUTE OF SPORTS
OLD MOTI BAGH: PATIALA-147001**

**POST GRADUATE DIPLOMA IN
STRENGTH AND CONDITIONING (ONE YEAR)**

Session 2023 – 24 Onwards
2024-25

J.b

ORDINANCES

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR)

Examinations (Two Semester System)

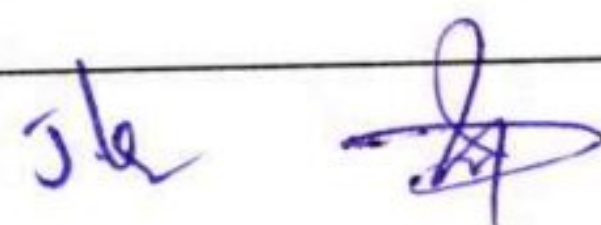
Programme Code- SNCD1PUP

1. The examination for the degree of POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR) shall be held in one academic year to be called POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR) shall consist of two Semesters viz. Part- I Semester Ist and 2nd. The examination of the Part- I Semester Ist and 2nd shall be held as per the Academic calendar of Punjabi University, Patiala.
2. POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR) shall be open to a candidate who has the following qualification with at least 50% marks in the aggregate from this University or any other University recognized as Equivalent thereto by the Academic Council.
 - Bachelor's Degree in Sports Sciences/Physical Education/Physiotherapy/ Open to all disciplines OR
 - Diploma in Sports Coaching.
3. Submission of migration certificate at the time of Admission is compulsory.
 - a. The Assessment in each semester of POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year) will be **30% internal and 70% external** for each theory paper. The result of the Internal Assessment shall be conveyed to the examination branch of Punjabi University, Patiala by the Academic wing of NSNIS.
 - b. The internal assessment of (theory) (Total marks 30) will be based on all or some of the Following:
 - Worksheets/Assignment/Seminar – 40%
 - Quiz 40%
 - Attendance 20%
 - c. The internal assessment for Practical – components will be
 1. Demonstration – 20%
 2. Attendance – 20%
 3. File – 20%
 4. Assignments/reports/Seminar - 40%
 - d. The internal assessment for Project (Total marks 30) will be based on all or some of the Following:
 - Punctuality and Discipline 50%
 - Presentation and Report 50%

Note: If a case comes to notice of the Senior Executive Director or Director Academics, where the marks awarded by the Teacher are on a very Higher/Lower side, the award will be got moderated by the following committee.

- I. Director Academics of the NIS Patiala
- II. Course Coordinator / COE
- III. Head of the Department concerned
- IV. A member as nominee of Senior Executive Director NSNIS

4. The student who fails in the theory paper(s) in the external exam, the internal assessment will remain the same, and the said student will have to appear and pass the external exam only.
5. Minimum number of marks required to pass each semester examination will be 40% for each paper and 40% in the aggregate of the semester examination; 40% in practical papers.
6. The syllabus for the session shall be as prescribed by the NSNIS and passed by members of Board of Studies of Punjabi University, Patiala.
7. POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year) examination is open only to candidate who satisfies the following requirements:
 - a) Has been on the rolls of the NSNIS throughout the Semester term preceding the examination.
 - b) of having good moral character.
 - c) of having attended not less than 75% lectures delivered to that class in each Paper as well as 75% of the practical work, seminars etc. separately. Provided that a deficiency in attendances may be condoned for special reasons, as per the university rules.
8. The medium of instruction shall be English.
9. The medium of examination will be English, or Punjabi.
10. Subject to completion of attendance requirement, there will be a condition of appearing or passing in papers for promotion from first semester to second semester in an academic Session. A candidate placed under reappear in any paper, will be allowed two chances to clear the reappear, which should be availed within consecutive two years/chances i.e., to pass in a paper the candidate will have a total of three chances, one as regular student and two as reappear candidate.
11. The examination of reappear papers of odd semester will be held with regular examination of the odd semester and reappear examination of the even semester will be held with regular examination of even semester. But if a candidate is placed under reappear in the last semester of the course, the candidate will be provided a chance to pass the reappear with the examination of the next semester, provided their reappear of lower semester does not go beyond next semester. In case a candidate fails



within the prescribed period, as aforesaid, the candidate shall be declared fail. Such a candidate may, however, seek fresh admission to the first semester on merit with the new applicants. It is understood that a 'reappear' or 'failed' candidate/s shall be allowed to take the examination in papers not cleared by them according to the date sheets of the semester examinations in which such papers may be adjusted.

12. If a student gets 'F' grade in a subject he/she will appear for End Semester Examination Only and his/her internal marks obtained during regular semester will be consider and carried forward.
13. If a student gets 'D' grade (Detained) in a subject then he/she will have to appear in End Semester Examination as well as Internal Examination. However, Internal Examination in this case will carry maximum marks equal to the total Internal Marks. E.g. If Internal Weightage is 30% of total 100 marks for a paper then this special Internal Test will be 'of 30 Marks. Candidate will submit application to Head of Department for this Purpose.
14. Only the Candidates who Need to reappear only in External Examination and marks of Internal will be carried forward.
15. The End -Semester examination -3 hours duration. The question paper will consist of three sections, SECTION A, B, and C. SECTION A and B will have four questions each from the respective sections of the syllabus. Each question will carry 12 marks, which may be segregated into sub-parts. Section C will be compulsory with 11 short- answer type questions of 03 marks each, which will cover the entire syllabus.
16. Viva Voce/ Practical examination shall be conducted by a Committee consisting of the following:
 - d) One external examiner.
 - e) One internal examiner.
17. As soon as possible after the completion of each semester, the Registrar shall publish a list of successful candidates showing their result. Each candidate shall be supplied with a card containing his/her details of marks. Priory, the list of successful candidates on the competition of One year diploma in Strength & Conditioning course shall be arranged in three divisions as follows Successful candidates who obtain 60% or more of the aggregate number of Marks in Part- I Semester Ist and Semester 2nd examinations taken together, shall be Placed in first division, those who obtain 50% marks or more but less than 60% shall be placed in the second division and those who obtain less than 50% and more than 40% shall be placed in the third division. Successful candidates who obtain 75% or more marks in the aggregate will be placed in the "First Division with Distinction". In the adopted "Choice Based Credit system" pattern the above-mentioned pass % criterion has been revised to that of letter grade as given in the table, highlighted below. Each letter grade indicates the level of performance in the course and has a grade point for the purpose of computing the " Cumulative Grade Point Average " (CGPA) as given below.

Letter Grade Marks Grade points

- O: Outstanding 91-100
- A+: Excellent 81-90
- A: very Good 71-80
- B+: Good 61-70
- B: Above Average 51-60
- C: Average 41-50
- P: Fair 35-40
- F: Fail 0
- D: Detained: 0

14. *A candidate who has passed POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR) examination from NSNIS shall have one chance, within a period of two years, after passing the examination, to improve his division in a maximum of 1/3 of total theory papers offered in both POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR) I & II semester examinations. The candidates shall also be entitled to grace marks as admissible under the ordinance relating to grace marks.

15. POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR) course consists of a number of courses. The term 'course' is applied to indicate a logical part of the subject matter of the program and is invariably equivalent to the subject matter of a "paper" in the conventional sense.

- a) The candidates are required to give their preference order for specialization, if any.
- b) Specialization will be choice based.

A minimum of passing marks will be given to candidates who have reappeared for the purpose of calculation of their merit.

*Note: Out of papers taken up the candidate will be given the benefit of increase in marks, where the marks have increased in Paper/Papers.

Syllabus

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (ONE YEAR)

Examinations (Two semester system)

Program Code- SNCD1PUP

Program Description:

The scientific application of strength and conditioning, in sports-specific contexts, has emerged as one of the most vibrant study areas in recent years. The mission of the Diploma in Strength and Conditioning program is to enhance the education of highly qualified strength & conditioning professionals through an inter professional curriculum integrated with opportunities to excel in research, advanced professional skills, and leadership development; ultimately translating experiences into their respective professions and future employment opportunities. The curriculum enhances fundamental concepts through advanced strength and conditioning courses while also including complementary subjects such as sports nutrition and sports rehabilitation. The goals are to: equip students with a diverse and advanced knowledge base in the field of strength and conditioning; instill confidence in student's practical skills; and develop professionals who can interpret and apply research in their practice. This course is designed to enhance the students' current level of knowledge and expertise to an advanced level in the area of strength training and conditioning. Emphasis is placed on the exercise sciences (including anatomy, exercise physiology, biomechanics and nutrition), exercise technique, program design, organization and administration, and testing and evaluation.

Course Name: POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year)

Program Objectives:

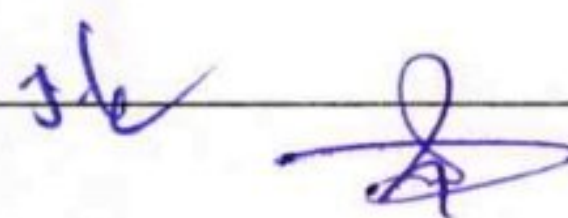
This subject will provide adequate technical information and skills to the candidates for the following:

1. Designing appropriate programs for the development of various fitness components.
2. Develop skills for organizing training programs
3. Develop skills for planning the training.
4. Develop skills of periodizing the training.
5. Develop skills for test, measurement and evaluation in strength & Conditioning.
6. Develop skills for monitoring of the training process.

Program Outcomes:

After completing this course, the student will be able to

1. Achieve proficiency in different exercises execution.
2. Achieve adequate skills for the selection of appropriate exercises suitable for different sports disciplines.
3. Achieve adequate skills for the selection of appropriate exercises suitable for different age groups
4. Achieve adequate skills for the selection of appropriate exercises suitable for different phases of training programs.
5. The students will acquire skills for making different training plans according to the demand of the individual athlete following the training principles
6. The students will acquire skills for making different training plans according to the demand of the sport following the training principles.



SEMESTER: I

| S. No. | Paper code | Subject | Total credits | Hours/ Week | | | Marks | | Total Marks |
|-----------|------------|---|---------------|-------------|---|----|----------|----------|-------------|
| | | | | L | T | P | Internal | External | |
| Theory | | | | | | | | | |
| 1 | SNCD1101T | Strength and conditioning 1 - Physiology | 3 | 2 | 1 | 0 | 30 | 70 | 100 |
| 2 | SNCD1102T | Applied Biomechanics in Strength and Conditioning | 3 | 2 | 1 | 0 | 30 | 70 | 100 |
| 3 | SNCD1103T | Fundamentals of Strength & Conditioning | 3 | 2 | 1 | 0 | 30 | 70 | 100 |
| 4 | SNCD1104T | Periodization: Theory and Methodology of Training | 3 | 2 | 1 | 0 | 30 | 70 | 100 |
| Practicum | | | | | | | | | |
| 5 | SNCD1105P | Sports Science Testing of Elite Athletes | 2 | 0 | 0 | 4 | 15 | 35 | 50 |
| 6 | SNCD1106P | Strength & Conditioning I | 4 | 0 | 0 | 8 | 30 | 70 | 100 |
| 7 | SNCD1107P | Project I | 4 | 0 | 0 | 0 | 30 | 70 | 100 |
| | | Total | 22 | 4 | 4 | 12 | | | 650 |

SEMESTER: II

| S. No. | Paper code | Subject | Total credits | Hours/ Week | | | Marks | | Total Marks |
|-----------|------------|---|---------------|-------------|---|---|----------|----------|-------------|
| | | | | L | T | P | Internal | External | |
| Theory | | | | | | | | | |
| 1 | SNCD1201T | Data Management and Statistics | 3 | 2 | 1 | 0 | 30 | 70 | 100 |
| 2 | SNCD1202T | Program Design, Periodization and Monitoring | 3 | 2 | 1 | 0 | 30 | 70 | 100 |
| 3 | SNCD1203T | Evaluations and Special Considerations in Strength and Conditioning | 3 | 2 | 1 | 0 | 30 | 70 | 100 |
| Practicum | | | | | | | | | |
| 4 | SNCD1204P | Advance Strength and Conditioning methods | 4 | 0 | 0 | 8 | 30 | 70 | 100 |
| 5 | SNCD1205P | Project II | 3 | 0 | 0 | 0 | 30 | 70 | 100 |
| 6 | SNCD1206P | Internship | 6 | 0 | 0 | 0 | 30 | 70 | 100 |
| | | Total | 22 | 3 | 3 | 8 | | | 600 |

Total Credits - 44

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year)

FIRST SEMESTER

PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING
(One Year)**

Program Code- SNCD1PUP

Part- I Semester I

Theory Paper I – Strength and Conditioning-1 Physiology

Paper Code- SNCD1101T

External Marks: 70

Teaching Hours: 45

Internal Marks: 30

Credit: 03

Total Marks: 100

Max Pass Marks: 40%

Exam Time: 03 Hours

Instructions for Paper Setter (Total marks=70)

The question paper will consist of three sections i.e. A, B, and C. The questions shall be covered each. Section A and B will have four questions each from respective sections of syllabus and will carry 12(12X4=48) marks each. Out of which students have to attempt two questions each from section A and B. Section C will consist of 11 short answer type questions of 2 marks each. This section will cover the entire syllabus uniformly and will carry 22 marks in all.

Instructions for the Candidates

Candidates are required to attempt two questions each from sections A and B. Section C is a compulsory consist of 11 short answer type questions of 2 marks each.

Section – A

1. Bioenergetics

- 1.1. Basics of ATP-CP, Aerobic & Anaerobic Metabolic Pathways

2. Cardiovascular system

- 2.1. Functional Anatomy of heart and blood vessels; Conduction system in heart; Normal electrocardiogram; Systemic, Coronary and Pulmonary circulation; Cardiac cycle; Cardiac output and BloodPressure.
- 2.2. Hemodynamics: Circulation and its control, Determinants of blood flow,
Cardiovascular regulation

3. Respiratory System

- 3.1. Functional Anatomy of respiratory system
- 3.2. Pulmonary ventilation; diffusion of oxygen and carbon-di-oxide from respiratory membrane;

- 3.3. Volumes & Capacities
- 3.4. Transport of oxygen and carbon-di-oxide. & Regulation of respiration

4. Neuromuscular system

- 4.1. Structure and Types of muscles/ Muscle Fibers
- 4.2. Excitation contraction coupling
- 4.3. Force vs length and Stretch reflex, proprioceptors, Golgi tendon organ (GTO), muscle spindles
- 4.4. Effect of training on fibers
- 4.5. Physiology of Fatigue and recovery

Section - B

5. Nervous System

Classification of nervous system (Central and peripheral); Structure and Function of neuron; Role of action potential in neuronal transmission; Neurotransmitters, Organization of the CNS & PNS, Ascending & Descending tracts, Functions of Cerebellum, Functions of the Cortical Nuclei & Neo-cortex

6. Digestive system

- 6.1. Functional Organization of Digestive system, Enzymes, Digestion & Absorption

7. Special Senses

- 7.1. Vestibular Apparatus. Other Sensory Organs.

8. Renal & Excretory System

- 8.1. Functional organisation of Renal & Reproductive systems

9. Endocrine System

- 9.1. Different endocrine glands and their hormones; Major functions; Mode of action mechanism and regulation, Functions & abnormalities, Details of Growth, Stress Hormones & Sex Hormones

II. Pedagogical intervention

Blended learning approach attending lectures, seminars, workshops, problem solving tasks, small group discussion and presentations and self-directed studies

III. Assessment

- a. Internal Assessment – attendance, internal test, Presentations, written assignment, case studies, placement log books
- b. End semester assessment – Written exam

IV. References

- 1. Physiology of sports and Exercise. Wilmore JH, Costill DL. HumanKinetics publishers
- 2. Exercise Physiology: Theory and application to Fitness and performance. Scott K Powers, Edward T. Howley. McGraw Hill.
- 3. Physiological Basis for Exercise and Sport. Edward L Fox. McGraw Hill.

PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part- I Semester I

Theory Paper II – Applied Biomechanics in Strength and Conditioning

Paper Code- SNCD1102T

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 45

Credit : 03

Min Pass Marks : 40%

Instructions for Paper Setter (Total marks=70)

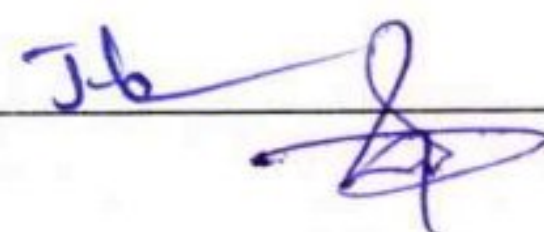
The question paper will consist of three sections i.e. A, B, and C. The questions shall be covered each. Section A and B will have four questions each from respective sections of syllabus and will carry 12(12X4=48) marks each. Out of which students have to attempt two questions each from section A and B. Section C will consist of 11 short answer type questions of 2 marks each. This section will cover the entire syllabus uniformly and will carry 22 marks in all.

Instructions for the Candidates

Candidates are required to attempt two questions each from sections A and B. Section C is a compulsory consist of 11 short answer type questions of 2 marks each.

Section - A

1. Kinesiology
 - 1.1. Meaning and importance of kinesiology in sports,
 - 1.2. Reference system,
 - 1.3. Fundamental movements
2. Structure of motor action
 - 2.1. Acyclic Motor Action
 - 2.2. Cyclic Motor Action
 - 2.3. Motor action combination
 - 2.4. Relationship among different motor action
 - 2.5. Phases of motor action
3. Movement quality
 - 3.1. Movement rhythm
 - 3.2. Movement coupling



- 3.3. Movement precision
- 3.4. Movement amplitude
- 3.5. Movement flow
- 4. Kinesiological analysis of various movements
 - 4.1. Walking,
 - 4.2. Running,
 - 4.3. Jumping,
 - 4.4. Throwing,
 - 4.5. Catching

Section - B

- 1. Sports Biomechanics
 - 1.1. Meaning and scope of sports biomechanics in field of strength and conditioning
 - 1.2. Kinematic
 - 1.3. kinetic
- 2. Concept of force in strength and conditioning
 - 2.1. Form of motion,
 - 2.2. concept of force and integration
- 3. Laws of Mechanics
 - 3.1. Applying Newton's laws of motion in understanding of sporting performance
 - 3.2. Lever system,
 - 3.3. Equilibrium and Stability

Recommended Readings

- 1. Biomechanics of skeletal muscles, Vladimir M. Zatsiorsky & Boris I. Prilutsky, Human Kinetics
- 2. Biomechanics of Sport and Exercise, Peter M. McGinnis, Human Kinetics
- 3. Fundamentals of Biomechanics, Duane Knudson, Springer
- 4. Joint structure and function: Comprehensive Analysis, Pamela K. Levangie, Cynthia C. Norkin,
- 5. Basic Biomechanics, Susan J. Hall, McGraw-hill
- 6. Handbook of Biomechanics and Human Movement Science, Youlian Hong and Roger Bartlett, Routledge International Handbooks

J-b


PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part- I Semester I

Theory Paper III – Fundamentals of Strength & Conditioning

Paper Code- SNCD1103T

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 45

Credit : 03

Min Pass Marks : 40%

Instructions for Paper Setter (Total marks=70)

The question paper will consist of three sections i.e. A, B, and C. The questions shall be covered each. Section A and B will have four questions each from respective sections of syllabus and will carry 12(12X4=48) marks each. Out of which students have to attempt two questions each from section A and B. Section C will consist of 11 short answer type questions of 2 marks each. This section will cover the entire syllabus uniformly and will carry 22 marks in all.

Instructions for the Candidates

Candidates are required to attempt two questions each from sections A and B. Section C is a compulsory consist of 11 short answer type questions of 2 marks each.

SECTION: A

1. Introduction to Strength and Conditioning - Meaning/Definition, a brief history of Snc, current scenario.
2. The strength and conditioning profession, potential duties, roles and responsibilities, membership, and certifications.
3. Basic Strength and conditioning principles
 - (a) Progressive Overload, Methods, in RT, AT, (b) individualization,
 - c) Progression, (d) Specificity, (e) Variations) Detraining (Principle of Reversibility) myths and misconceptions.

SECTION: B

1. Strength Training modalities: Definition of strength, types of strength, benefits of strength training.
2. Strength training modalities: body weight, partner, machines, free weights etc), Free weights versus machines, its advantages and disadvantages.
3. Various modes and ways of strength training: Elastic bands, tubing, chains and springs other ways.
4. Exercise techniques for alternative modes and non-traditional implement training.

Recommended Textbook:

1. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
2. ACSM's Foundations of Strength Training and Conditioning
3. Essentials of Strength and conditioning NSCA

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PUNJABI UNIVERSITY, PATIALA

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year)

Program Code- SNCD1PUP

Part- I Semester I

Theory Paper IV – Periodization: Theory and Methodology of Training

Paper Code- SNCD1104T

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 45

Credit : 03

Min Pass Marks : 40%

Instructions for Paper Setter (Total marks=70)

The question paper will consist of three sections i.e. A, B, and C. The questions shall be covered each. Section A and B will have four questions each from respective sections of syllabus and will carry 12(12X4=48) marks each. Out of which students have to attempt two questions each from section A and B. Section C will consist of 11 short answer type questions of 2 marks each. This section will cover the entire syllabus uniformly and will carry 22 marks in all.

Instructions for the Candidates

Candidates are required to attempt two questions each from sections A and B. Section C is a compulsory consist of 11 short answer type questions of 2 marks each.

Section - A

1. Basic for Training
 - 1.1. Scope of Training
 - 1.2. Objectives of Training
 - 1.3. Classification of Skills
 - 1.4. System of Training
 - 1.5. Adaptation
 - 1.6. Supercompensation Cycle and Adaptation
 - 1.7. Sources of Energy
2. Principles of Training
 - 2.1. Multilateral Development Versus Specialization
 - 2.2. Individualization

- 2.3. Development of the Training Model
- 2.4. Load Progression
- 2.5. Sequence of the Training Load
- 2.6. Summary of Major Concepts

- 3. Variables of Training
 - 3.1. Volume
 - 3.2. Intensity
 - 3.3. Relationship Between Volume and Intensity
 - 3.4. Density
 - 3.5. Complexity

Section - B

- 4. **Annual Training Plan, Periodization- Definition, Central concepts (GAS, FITNESS, FATIGUE PARADIGM)**
 - 4.1 Periodization
 - 4.2 Periodization of Biomotor Abilities
 - 4.3 Periodization of Strength Training
 - 4.4 Periodization of Endurance
 - 4.5 Periodization of Speed
 - 4.6 Integrated Periodization
 - 4.7 Annual Training Plan Phases and Characteristics

- 5. Training Cycles
 - 5.1 Microcycle
 - 5.2 Mesocycle
 - 5.3 Macrocycle

- 6. Workout Planning
 - 6.1 Importance of Planning
 - 6.2 Planning Requirements
 - 6.3 Types of Training Plans
 - 6.4 Training Session
 - 6.5 Daily Cycle of Training

Recommended Readings

- Periodization Theory and Methodology of Training Sixth Edition Tudor O. Bompa, Phd



PRACTICAL

PUNJABI UNIVERSITY, PATIALA

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year)

Program Code- SNCD1PUP

Part- I Semester I

PRACTICAL PAPER V: Sports Science Testing of Elite Athletes

PAPER CODE : SNCD1105P

External Marks : 35

Internal Marks : 15

Total Marks : 50

Exam Time :02 hour

Teaching Hours : 60

Credit : 02

Min Pass Marks : 40%

1. Physiology Tests:
 - a. YO-YO Test
 - b. Queen College Test
 - c. VO2max Assessment
 - d. Wingate Test
 - e. RAST Test
2. Anthropometry Tests:
 - a. Body Composition
 - b. Body Physique
 - c. Body proportion
3. Biomechanic Test
 - a. Drop jump testing
 - b. 6x10m shuttle run test
 - c. 30m fly
 - d. 800m

Recommended Textbook:

1. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
2. ACSM's Foundations of Strength Training and Conditioning

PRACTICAL

PUNJABI UNIVERSITY, PATIALA

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year)

Program Code- SNCD1PUP

Part- I Semester I

Practical Paper VI: Strength & Conditioning I

PAPER CODE: SNCD1106P

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 02 Hours

Teaching Hours : 120

Credit : 04

Min Pass Marks : 40%

Strength and Conditioning Tests:

1. Sit and Reach
2. Standing Broad Jump
3. Pull Ups
4. Push Ups
5. Back Strength : Hyper Extension Below 15, Deadlift above 15
6. Core Plank
7. Hand Grip Endurance
8. Shoulder flexibility test
9. Standing press
10. Standing Vertical jump test
11. 1 and 3 RM Testing

Recommended Textbook:

4. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
5. ACSM's Foundations of Strength Training and Conditioning

PUNJABI UNIVERSITY, PATIALA

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year)

Program Code- SNCD1PUP

Part- I Semester I

PRACTICAL

PAPER VII: Project I

PAPER CODE: SNCD1107P

External Marks : 70

Internal Marks : 30

Total Marks : 100

Exam Time : 3 Hours

Teaching Hours : 120

Credit : 04

Min Pass Marks : 40%

Preparation of education Material for athletes: Like Mobility Program for Various discipline ,
Injury prevention program etc

Case Studies

Total marks: 100

Assessment areas

| Sr. No. | Assessment Area | Marks allotted | |
|------------|--|----------------|----------|
| | | Internal | External |
| 1 | Punctuality and discipline <ul style="list-style-type: none">• Regularity• Punctuality• Discipline• Originality• Innovation | 15 | -- |
| 4 | Viva <ul style="list-style-type: none">• Comprehension• Critical thinking• Confidence• Communication• Spontaneity and mannerism | -- | 35 |

| | | | |
|---|--|----|----|
| 5 | Presentation and report <ul style="list-style-type: none"> • Content • Report writing • Powerpoint presentation • Language and delivery • Audience interaction | 15 | 35 |
|---|--|----|----|

Recommended Textbook:

1. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
2. ACSM's Foundations of Strength Training and Conditioning

POST GRADUATE DIPLOMA IN STRENGTH AND CONDITIONING (One Year)

SECOND SEMESTER

PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part I SEMESTER II

Theory Paper I – Data Management and Statistics

Paper Code- SNCD1201T

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 45

Credit : 03

Min Pass Marks : 40%

Instructions for Paper Setter (Total marks=70)

The question paper will consist of three sections i.e. A, B, and C. The questions shall be covered each. Section A and B will have four questions each from respective sections of syllabus and will carry 12(12X4=48) marks each. Out of which students have to attempt two questions each from section A and B. Section C will consist of 11 short answer type questions of 2 marks each. This section will cover the entire syllabus uniformly and will carry 22 marks in all.

Instructions for the Candidates

Candidates are required to attempt two questions each from sections A and B. Section C is a compulsory consist of 11 short answer type questions of 2 marks each.

Section-A

1. Basics of Research
 1. Meaning types, significance and various methods of research
 2. Meaning, definition, classification and importance of statistics in physical education and sports.
 3. Meaning, Kinds and distribution of data, frequency distribution, construction of frequency distribution table.
 4. Tests of central tendency.
- 2 **Meaning and definition of variability, Probability.**
 - 2.1 Types of variability measures
 - 2.2 Calculation of tests of variability
 - 2.3 Relationship between variability measures
 - 2.4 Meaning & definition of probability

- 2.5 Normal probability curve
- 2.6 Principle and properties of normal curve
- 2.7 Uses of the normal curve in statistics

- **Descriptive statistics only**:- No statistical content, or descriptive statistics only (e.g., percentages, means, standard deviations, standard errors, histograms)
- **t-tests** -: Procedures for comparing two means (one-sample, matched-pair, and two sample t-tests)
- **ANOVA** Comparing several means (e.g., Simple and repeated one-way Analysis of variance, analysis of covariance, factorial ANOVA, mixed ANOVA, Ftests)
- **Multiple comparisons** Procedures for handling multiple inferences (e.g., Newman-Keuls, Bonferroni, Tukey, Scheffé's contrasts, Duncan tests)

Section-B

- 3. Norms and standards
 - 3.1 Meaning and definition & Difference between norms and standards
 - 3.2 Scales of norms and methods of their calculation
 - 3.3 Define Z scale, stanine scale, T scale, Hull scale, percentile sigma scale, I.Q. scale, GRE scale.
 - 3.4 Uses of Diagramatic Presentation of data
 - 3.5 Rules of diagram construction
 - 3.6 Types of diagram
 - 3.7 Types of area diagram

4. Correlation , interpretation.

- 4.1 Linear correlation or rectilinear correlation
- 4.2 Computation of coefficient of correlation
- 4.3 Interpretation of coefficient of correlation (r) and significance of r
- 4.4 Properties of rCoefficient of determination
- 4.5 Uses of coefficient of correlation
- 4.6 Prediction/ regression equations
- 4.7 The relation between regression coefficient and correlation coefficient
- 4.8 Comparison of correlation and regression analysis.
 - **Non-parametric tests** Non-parametric statistics/distribution-free tests (e.g., Sign test, Wilcoxon signed-rank test, Mann-Whitney test, Kruskal-Wallis, Friedman tests)
 - **Correlation** Pearson correlation coefficient and testing
 - **Non-parametric correlation** Spearman's rho, Kendall's tau test, test for trend
 - **Simple Linear regression** Least-squares regression with one predictor and one outcome variable

- **Multiple regression** Complex model with several predictors (Hierarchical regression, Forced entry or Enter regression, and Stepwise methods)
- **Contingency/Multiway tables** Chi-square tests, Fisher's exact test, McNemar's test, Mantel-Haenzel procedure, log-linear methods
- **Reliability** Intra-class correlations coefficient, Cronbach's alpha, Cohen's kappa
- **Epidemiology statistics** Measures of association (e.g., relative risk, odds ratio, rate ratio)
- **Other** Anything not fitting above headings, includes Factorial analysis, ROC curves, cluster analysis, structural equation modeling

Recommended Books :

- Bailey, N.T.J.- Statistical methods in Biology, The English universities press, London.
- Bajpai, S.R.- Methods of Social Survey and Research, Kitab Ghar, Kanpur.
- Colton- Statistics in medicine, Little Brown Company, Boston
- Gupta, S.P. Statistical methods, Sultan Chand and Sons Publishers, New Delhi.
- Goulden C.H. Methods of Statistical Analysis, Asia Publishing House, New Delhi.
- Kansal, D.K. Text book of Applied Measurement Evaluation & Sports selection. SSS Publications, New Delhi.
- Mahajan- Methods in Biostatistics, Jay Pee Brothers. Medical Publishers (P) Ltd., New Delhi.
- Kumar, R.- Research Methodology, Pearson Education, Australia.
- Snedecor, G.W. Statistical Methods, Allied Pacific Pvt. Ltd. London.
- Singh, I-Elementary Statistics for Medical Workers, Jaypee Brothers Medical Publishers (P) Ltd. New Delhi

PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part I SEMESTER II

Theory Paper II – Program Design, Periodization and Monitoring

Paper Code- SNCD1202T

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 45

Credit : 03

Min Pass Marks : 40%

Instructions for Paper Setter (Total marks=70)

The question paper will consist of three sections i.e. A, B, and C. The questions shall be covered each. Section A and B will have four questions each from respective sections of syllabus and will carry 12(12X4=48) marks each. Out of which students have to attempt two questions each from section A and B. Section C will consist of 11 short answer type questions of 2 marks each. This section will cover the entire syllabus uniformly and will carry 22 marks in all.

Instructions for the Candidates

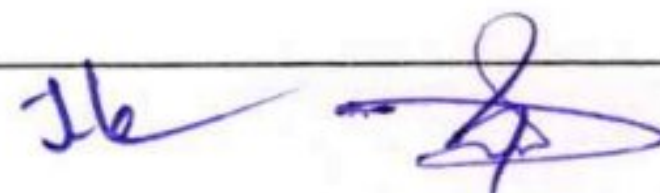
Candidates are required to attempt two questions each from sections A and B. Section C is a compulsory consist of 11 short answer type questions of 2 marks each.

Section - A

1. Programme design for resistance training- Exercise prescription, steps (needs analysis, exercise selection, exercise order, number of repetitions and sets, rest periods)
2. Programme design for aerobic endurance training- Endurance Definition, types and importance, factors related to aerobic endurance performance.
3. Aerobic training, modes of AT, FIVD of AT, Types of Aerobic endurance training workouts.
4. Periodization of AE for various sports. Training at altitude, myths and misconceptions.

Section -B

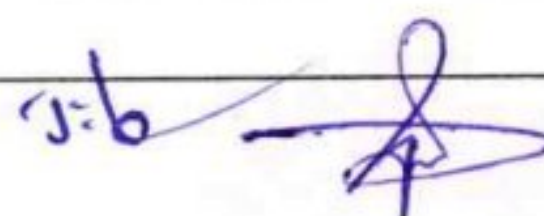
1. Programme design for speed, agility, quickness and balance- Speed definition, importance, factors affecting speed. Programme designing for speed, Periodization of speed.



2. Meaning and definition of Agility, quickness and balance, importance and programme designing
3. Programme design and techniques for flexibility training- Flexibility definition, importance, types and factors related to flexibility. Programme designing and methods of flexibility training.

Recommended Textbook:

6. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
7. ACSM's Foundations of Strength Training and Conditioning
8. Developing Agility and Quickness NSCA
9. Developing Endurance NSCA
10. Developing Power NSCA
11. Developing Speed NSCA
12. Essentials of Strength and conditioning NSCA



PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part I SEMESTER II

**Theory Paper III – Evaluations and Special Considerations in Strength and
Conditioning**

Paper Code- SNCD1203T

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 45

Credit : 03

Min Pass Marks : 40%

Instructions for Paper Setter (Total marks=70)

The question paper will consist of three sections i.e. A, B, and C. The questions shall be covered each. Section A and B will have four questions each from respective sections of syllabus and will carry 12(12X4=48) marks each. Out of which students have to attempt two questions each from section A and B. Section C will consist of 11 short answer type questions of 2 marks each. This section will cover the entire syllabus uniformly and will carry 22 marks in all.

Instructions for the Candidates

Candidates are required to attempt two questions each from sections A and B. Section C is a compulsory consist of 11 short answer type questions of 2 marks each.

SECTION A

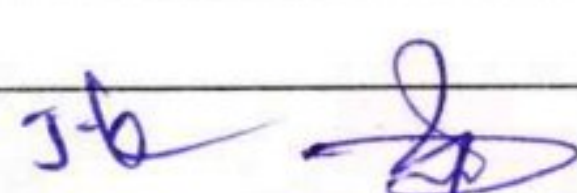
- 1.Evaluation of physical fitness components- Tests, measurements and evaluation (types of tests , evaluation and interpretation of the data for different sports.
2. Evaluation and interpretation of the data), different test protocols for the evaluation of motor abilities, Khelo india test batteries

SECTION B

- 1.Strength training for different populations (children, females and senior citizens)
- 2.Strength and conditioning for rehabilitation and reconditioning .

Recommended Textbook:

1. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
2. ACSM's Foundations of Strength Training and Conditioning
3. Essentials of Strength and conditioning NSCA
4. Periodization Theory and Methodology of Training Sixth Edition Tudor O. Bompa, PhD



PRACTICAL

PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part I SEMESTER II

Practical Paper IV– Advance Strength and Conditioning methods

Paper Code- SNCD1204P

External Marks : 70

External Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 120

Credit : 04

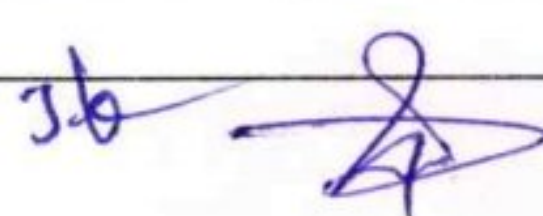
Min Pass Marks : 40%

1. Advanced Training Methods: Standard sets and reps, tempo, tempo methods, supersets, unilateral loading, drop sets, pyramid set.
2. VBT methods
3. Complex training
4. Speed and Agility training and methods
5. Rower/skiing workout
6. Watt bike/Treadmill advanced training protocols
7. Weight Reduction Programs
8. Periodization for various sports

Recommended Textbook:

1. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
2. ACSM's Foundations of Strength Training and Conditioning
3. Essentials of Strength and conditioning NSCA
4. Periodization Theory and Methodology of Training Sixth Edition Tudor O. Bompa, PhD
5. Developing Speed NSCA

PRACTICAL



PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part I SEMESTER II

Practical Paper V- Project II

PAPER CODE : SNSD1205P

External Marks : 70

Internal Marks : 30

Total Marks : 100

Exam Time : 03 Hours

Teaching Hours : 90

Credit : 03

Min Pass Marks : 40%

Review Article on Strength and Conditioning , Prepare various assignment on given topics

1. Olympic weightlifting prep program
2. Exercise Technique and progression , Push, pull ,hing, rotation, brace.
3. Program designing
4. Exercise variations
5. Cluster sets

Total marks: 100 Assessment areas

| <u>Sr. No.</u> | <u>Assessment Area</u> | <u>Marks allotted</u> | |
|----------------|---|-----------------------|-----------------|
| | | <u>Internal</u> | <u>External</u> |
| 1 | Punctuality and discipline <ul style="list-style-type: none">● Regularity● Punctuality● Discipline● Originality● Innovation | 15 | -- |
| 2 | Viva <ul style="list-style-type: none">● Comprehension● Critical thinking● Confidence● Communication● Spontaneity and mannerism | -- | 35 |

| | | | |
|---|---|----|----|
| 3 | Presentation and report <ul style="list-style-type: none"> • Content • Report writing • Powerpoint presentation • Language and delivery • Audience interaction | 15 | 35 |
|---|---|----|----|

Recommended Textbook:

1. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
2. ACSM's Foundations of Strength Training and Conditioning
3. Essentials of Strength and conditioning NSCA
4. Periodization Theory and Methodology of Training Sixth Edition Tudor O. Bompa, PhD

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PRACTICAL

PUNJABI UNIVERSITY, PATIALA

**POST GRADUATE DIPLOMA IN STRENGTH AND
CONDITIONING (One Year)**

Program Code- SNCD1PUP

Part I SEMESTER II

Practical Paper VI: Internship*

PAPER CODE : SNCD1206P

External Marks : 70

Internal Marks : 30

Total Marks : 100

Exam Time :

Teaching Hours : 120

Credit : 06

Min Pass Marks : 40%

The internship experience provides the student with the opportunity to put into practice the lessons and skills discussed in the classroom. Students will get internship opportunities in various SAI centres of NCOE and can get experience working with elite players.

Completion of the internship must be under the supervision of an appropriately certified and trained field experience site supervisor(s) or Experts.

To ensure this experience provides the student with the proper educational value, the site supervisor(s) must meet the following criteria:

1. Be CSCS, ASCA certified, Experienced Strength and Conditioning expert. .
2. Ensure that student interns are directly supervised during day-to-day activities.
3. Provide instruction, assessment, and feedback for the application of current knowledge, skills, and abilities designated by the competencies for the degree listed in this handbook.
4. Demonstrate understanding of and compliance with the program's policies and procedures.

Internship Assessment Criteria (PGDSNC)

Duration: 04 Weeks

Credits: 6

Total Marks: 100 (30+70)

Places of Internship: 23 NCOES SAI centres across India

The internship centres will be allotted based on the choice given by candidate (as per merit order in 1st semester) and the availability of seats at a particular centre


Mentor/ Supervisor:SO/HPA/PA (Strength and Conditioning) incharge of the particular centre

Boarding and Lodging: The boarding and lodging facility can be provided at the centres, if available. The expenditure of the boarding and lodging will be borne by the candidate of their own

At the centres, where boarding and lodging facilities are not available, candidates will have to arrange the boarding and lodging of their own

Stipend: No stipend will be paid to the candidates for the internship

| Assessment areas | | | |
|------------------|--|---|---------|
| Sr. No. | Assessment Area | Assessment Criteria | Remarks |
| 1 | Ethics, punctuality and discipline | I. Discipline II. Punctuality III. Commitment towards training IV. Dynamism | |
| 2 | Program designing and Planning a session. (SWAT) | I. SWAT II. Exercise Selection III. Execution | |
| 3 | Case studies & load monitoring | I. Communication skills II. Ability to adjust with Group of athlete III. Ability to motivate athletes for following plan IV. Monitoring V. Follow ups | |
| 4 | On Field activities | I. Program planning II. Implementation III. Communication with coaches/athletes | |
| 5 | Presentation and report | I. Interpretation of reports II. Data presentation III. Case study presentation IV. Overall work report | |

3.6 

At the end of the internship, the Mentor/ Supervisor of the respective centre needs to provide the marks of the candidates in the given format.

Recommended Textbook:

1. Essentials of Strength and Conditioning (Haff & Triplett-4th edition)
2. ACSM's Foundations of Strength Training and Conditioning
3. Developing Agility and Quickness NSCA
4. Developing Endurance NSCA
5. Developing Power NSCA
6. Developing Speed NSCA
7. Essentials of Strength and conditioning NSCA
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