



*Arba Minch University  
College of Natural sciences  
Department of Sport Science*

*Harmonized Curriculum of Master of Science in Sport Medicine*

*Prepared by  
Higher Education professionals of Sport Science in collaboration with  
Federal Sport Commission, Ministry of Education and 13 Sport  
Federations of our Country*

*Revised November, 2015  
Arba Minch*

## 1. Background

The Masters of Science in the field of sport science is designed to train specialists, coaches, sportsmen, and like others on scientific lines and to impart knowledge to the existing situation of the country's problem that we are facing. Sport Science is one of the 21<sup>st</sup> century sciences, which provide scientific back up of coaching to National Federations, Fitness Centers, and Clubs. The program is concerned with producing talent base players based on the performance diagnostics and sport talent to various characteristics of sports, and promotes the production of highly qualified performance coaches and trainers, with extensive performance and versatile abilities to treat, rehabilitate and prevent injuries among athletes and sports enthusiast.

The extensive and rigorous use of scientific coaching principles in every item of sport disciplines and vigorous sporting competition with high sport injuries should be evaluated and monitored from the view that it should produce talent – oriented and competitive based athletes for the country.

Arba Minch University as one of oldest Universities in Ethiopia, since its establishment as a higher learning Institution, in 1979 E.C., has been playing its part by producing highly qualified intellectuals in many fields of specialization, including Sport Science.

The Sport Science Department, since its establishment (2004 E.C) is successful in offering Bachelor of Science Degree in Sport Science (the three years degree program). Presently, the Department is also launched Post Graduate program, particularly **Sport Medicine programs as mentioned in the curriculum.**

**The Mission of Department of Sport Science** is to let interested peoples attend different programs in turn solve the country's lack of qualified man power with its vision to be one of the competent departments in producing qualified Sport Science professionals in East Africa by 2020.

Therefore, the Millennium Goals the Federal Government, the Educational Policy of the country and the strategic plan of the University as a whole made us to take the initiative in proposing these fields of postgraduate study program.

## 2. Rationale

Ethiopia is one of the competitive countries in World Athletics' sport competitions, particularly, in long – middle distance and to some extent Marathon (which on and off) sport. This is thanks to the existing conducive environmental condition that breeds variety resistance and talented individuals (few in number). Sport events like, Ball Games, Short Distance Running, Throwing and Jumping, and Gymnastics we lag behind comparing as those of developed countries.

Thus, in order to provide the best scientific training and coaching and to impart professionals into the country, National Federations, and Clubs should begin to play a major role. These organizations have to provide the essential scientific back up.

### *The country at present,*

1. Doesn't have a well – studied or leaned system of scientific coaching system and a way to rehabilitate sportsmen during and after intensive competitions.
2. Lacks awareness to test and identify the nature of talented athletes using a scientific procedure to investigate high performances.
3. Lacks highly qualified professionals in performance diagnostics of talent spotting, testing or evaluating, and nurturing the ability and readiness of our country youngsters.

The program is also an initiative to upgrade one's existing knowledge and to continue further studies at Master's level, for those who graduated from different Universities of the country. This helps them to enrich their professional career by updating and familiarizing themselves with current, modern principles of sports science.

Therefore, we strongly believe that it is only through the application of sound scientific system of coaching and treating sportsmen from the view of sport science that we would be able to cope – up with those countries that have already achieved high performance in the field of sports.

Finally, the designed Masters program in the mentioned fields provides a deeper understanding and knowledge of the provision and practice of sports events and competition producing high level professionals in performance efficiency and elite levels of coaches, therapists, sport medicine doctors, surgeons, and researchers.

### **3. Objective of the Program**

#### **I. General Objective**

The objective of Mater's of Sports Science Degree program is to prepare graduates to become professionals in establishment of scientific principles for training, treating injuries in sports, able to select top level professional athletes to represent the country, explaining the importance of nutrition's in sports, diagnostics, rehabilitation, and reconditioning through design of rehabilitation programs, and offering psychological intervention.

#### **II. Specific Objectives**

This program has the following specific objectives:

- i. Communicate information about sports and exercise medicine and scientific values to the nation and concerned organizations,
- ii. Out – line a comprehensive programme for injuries prevention and treatment,
- iii. Present a scientific basis for all sports medicine, sport physiology, and sport biometry,
- iv. Familiarize the participants with theory and practice of a wide range of sporting disciplines,
- v. Define guidelines for the scientific monitoring and training of athletes,
- vi. Collaborate with national federation, clubs, and sport organization of the country,
- vii. Organize and administer treatment, rehabilitation and recondition program through design of scientific basis,
- viii. **Order equipment and supplies, supervise personnel, establish polices for operation of an athletic training program, and**
- ix. Finally, professional development and responsibilities through acting as an educator, trainer, doctor, and counselor.

#### ***4. Graduates Profile***

- Graduates of the programme will gain valuable insight into the key areas of injury prevention and management, health and physical activity
- Work in many areas from elite sport to community and exercise services
- A leader of the sport medicine team, which also include specialty physician and surgeons, athletics trainers, physical therapist and coaches
- Promotes lifelong fitness and well, and encourages prevention of illness and injury
- Treat disorder of musculoskeletal system which involve ligaments, bones, and muscles as well as chronic condition

#### ***5. Admission Criteria***

This M.Sc., is open to both medical and non- medical graduates with an appropriate background who wish to gain a thorough ground in the management of injury and exercise prescription. Students are accepted from diverse background including a primary medical qualification with GMC, a degree in manual therapy, nursing, physiotherapy, and sport science. Other disciplines will be considered on merit.

#### ***6. Graduation Requirements***

1. A minimum of cumulative grade point average (CGPA) above 3.00
2. No F and 2 C grades
3. Completion of thesis research work in his/her field of study as a fulfillment for the requirement of M.Sc.

#### ***7. Program Duration Degree Nomenclature***

##### **I. Program Duration**

The study lasts **for two years.** The first year is for course work studies and the second year is for Lab, Practical activities, research work, Thesis Proposal Defense and final Defense .

## II. Degree Nomenclature

Upon successful completion of the program, candidates will be awarded Master of Science Degree in Sports Medicine duly signed by the registrar on whom the official dry seal of the university rests .

Amharic Version

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### 8. Program Profile

*On the completion of the program, graduates will be able:*

- Understands the behavior of the athletes in different situations as the key areas of injury prevention and managements, health and treatment
- Define guidelines for the scientific monitoring of training athletes as a medical team focusing on the medical and therapeutic aspects of sports participation and physical activity
- Develop scientific bases of coaching for different sport skills and rehabilitating of athletes from elite sport to community and exercise services
- Prepare comprehensive programs of coaching manuals from the scientific point of view.

### I. List of Courses

No	Title of the Course	Course Code	Credit Hours
1	Research Methodology in Sport Medicine	SPSC 501	3
2	Introduction to Medicine	SPSC 511	3
3	General Theory and Methods of training	SPSC 521	3
4	Sport Psychology	SPSC 531	3
5	Kinesiology	SPSC 541	3
6	Exercise Physiology	SPSC 512	3
7	Clinical Medicine in Sports	SPSC 522	3
8	Introduction to Orthopedic Surgeon	SPSC 532	3
9	Therapy Science	SPSC 542	3
10	Sports nutrition	SPSC 552	3
11	Thesis and Internship	SPSC 601	6
		<b>Total</b>	<b>36</b>

## II. *Course Coding*

The offered course will have the following tags and course codes with the following Descriptions

1. M.Sc. Master of Sport Science in Sport
2. The first number indicates year
3. The middle number indicates area code (sport Medicine)
4. The last number refers to the semester

## III. **Course Breakdown**

The program is divided into two separate years of study and would have four semester.

### **Year One (Semester I)**

No	Course Title	Course Code	Cr. Hrs.
1	Research Methodology in Sport Medicine	SPSC 501	3
2	Introduction to Sport Medicine	SPSC 511	3
3	General Theory and Methods of Training	SPSC 521	3
5	Kinesiology	SPSC 541	3
6	Exercise Physiology	SPSC 551	3
		Total	15

### **Year One (Semester II)**

No	Course Title	Course Code	Cr.Hrs.
1	Clinical Medicine in sports	SPSC 512	3
2	Introduction to Orthopedic Surgeon	SPSC 522	3
3	Therapy Science	SPSC 532	3
4	Sport Nutrition	SPSC 542	3
4	Sport Psychology	SPSC 531	3
		<b>Total</b>	<b>15</b>

**Year Two (Semesters III, VI and VII)**

No	Course Title	Course Code	Cr. Hrs.
1	Thesis and Internship	SPSC 602	6

***9. Course Profile***

***A. Minor Courses***

***Course Description of each Subject irrespective of their Credits***

***SPSC 501. Research Methods in Sport Medicine and Orthopedic Surgeon-----3 Cr.Hrs***

- Design an in – depth knowledge of planning and designing Research studies Associated to Medicine and Orthopedic Surgeon
- Quantitative Research Techniques, Methods of Data Analysis, Ethical Considerations in Research to Sports Medicine
- Skills in Presenting Research Findings and Internship

**References**

- ◆ Verma J.P, A Text Book On Sports Statistics Published By Venus Publication in Feb. 2000
- ◆ Nelson Silverman, Stephen, Thomas, Jack, Research Methods in Physical Activity. ISBN-13: 9780736056205, Pub. Date: July 2005
- ◆ Clarke H.david, H. Harrison Clarke, Research Processes in Physical Education and Health

***SPSC. 511. Overview of Sport Medicine----- 3 Cr.Hrs.***

- Introduction to Pharmacy and Sport Medicine Terminology
- General Medical Care of Athletes
- Medical Evaluation of Athletes
- Types of Common Injuries in Sports and their Prevention
- Drug Trials on Treatment of Injuries



### References

- ◆ Bass, A.L: Treatment of Muscles, Tendon and Minor Joint Injuries in Sport, Proc. Roy. Soc. 62, 925, 1969.
- ◆ Rout ledge; Oxygen up take Kinetics in Sports, Exercise, and Medicine, 1 Edition, Jan, 21, 2005.

### **SPSC. 521. General Theory and Methods of Training ----- 3 Cr.Hrs**

- Performance Diagnostics
- Nurturing Sport Talent
- Fitness Norms
- Methods of Training
- Motor Development
- Training Process

### References

- ◆ Singh, Hardy (2009). Science of Sports Training, Fundamental of Sports Training
- ◆ Knutzen Joseph Hamill, Kathleen M. Biomechanical Basis of Human Movement. February 2008,
- ◆ Verma J.P, A Text Book On Sports Statistics Published By Venus Publication in Feb. 2000

### **SPSC. 531. Sport Psychology ----- 3. Cr.Hrs.**

- Psychological Preparations of Athletes for Competitions
- Personality issue in Sports
- Understanding the Dynamics of Motivation and Emotion in Sports and Exercise
- Leadership and Group cohesion in Sport and Exercises
- Evaluation of Specific Psychological Tests in Sport and Exercises

### References

- ◆ Knutzen Joseph Hamill, Kathleen M. Biomechanical Basis of Human Movement. February 2008,

- ◆ Singh, Hardy (2009). Science of Sports Training, Fundamental of Sports Training

**SPSC. 541. Kinesiology** ----- 3. Cr.Hrs.

- Kinesiology of Human Performance
- Neuromuscular Kinesiology
- Applied Kinesiology and Bio – Mechanics
- Cardiovascular Physiology Group
- Chronic Disease Group
- Environmental Physiology Group

**References**

- ◆ Human Kinetics; Applied Anatomy and Biomechanics in Sport, 1 Edition, Mar. 10, 2000.
- ◆ Human kinetics Canada Ltd.; Assessing Sport Skills, Mar. 6, 2001.
- ◆ Rout Ledge; Biomechanical Evaluation of Movement in Sport and Exercise; The British Association of Sport and Exercise Sciences Guide, 1 edition, Dec. 2007.

**SPSC. 551. Exercise Physiology** ----- 3. Cr. Hrs.

- Introduction to the Structure and Function of Muscles to Exercise with a particular emphasis to Plasticity and Adaptive Response to Load and Intensity
- Measurement analysis of Physiological Function of Sportsmen
- Physiological Demands in Various Games and Sports
- Talent Spotting on the Basis of Physical Growth
- Chronic Physiological Adaptation and Sport Performances

**References**

- ◆ Human Kinetics; Sport Physiology, 1 Edition. Aug, 20, 2004.
- ◆ Singh, Hardy (2009). Science of Sports Training, Fundamental of Sports Training
- ◆ Rout ledge; Oxygen up take Kinetics in Sports, Exercise, and Medicine, 1 Edition, Jan, 21, 2005.

- ◆ Human Kinetics; Applied Anatomy and Biomechanics in Sport, 1 Edition, Mar. 10, 2000.
- ◆ Human kinetics Canada Ltd.; Assessing Sport Skills, Mar. 6, 2001.
- ◆ Rout Ledge; Biomechanical Evaluation of Movement in Sport and Exercise; The British Association of Sport and Exercise Sciences Guide, 1 edition, Dec. 2007.

### ***B. Major Courses***

#### ***SPSC.521. Clinical Medicine in Sports -----3 Cr.Hrs***

- General Consideration and Clinical Examination of Respiratory System, Cardiovascular System, Investigation in Cardiology, Musculoskeletal and Locomotor System (Rheumatology), Hematology System, Endocrinology, Neurology, Clinical Examination and diseases of Dermatology, Psychiatry, Ophthalmology, and others
- Typical Sport Injuries Diagnose, Treatment, and Prevention of Injuries that occur during Sports and other Physical Activities
- Preventing and Care for Sport Related Injuries
  - a) Proper evaluation, treatment, and rehabilitation techniques for common sports injuries
  - b) Methods and tools, such as taping, applying heat, or cold packs and the use of pads
  - c) Health professions including protecting against diseases, blood born pathogens, and like others
- Talent Spotting on the Basis of Physical Growth
- Ergogenic Aids in Sports and their applicability
- Ethical and Health Related Issues
  - a) Mechanisms and Efficiency of a range of Nutritional and Pharmacological Supplements
- Emergency Sport Injuries and their Treatments
- Clinical Placement

## References

- ◆ Andersen, N.H. and Ramwell, P.W. (1974) Biological Aspects of Post Glands. Arch. Inter. Med. 133, 30.
- ◆ Barrow, H.M and McGee, R.: "A Practical Approach to Measurement in Physical Education" Third Edn., 1979, Lea and Febiger, Philadelphia.
- ◆ Bass, A.L: Treatment of Muscles, Tendon and Minor Joint Injuries in Sport, Proc. Roy. Soc. 62, 925, 1969.
- ◆ Rout ledge; Oxygen up take Kinetics in Sports, Exercise, and Medicine, 1 Edition, Jan, 21, 2005.
- ◆ Rout ledge; Oxygen up take Kinetics in Sports, Exercise, and Medicine, 1 Edition, Jan, 21, 2005.
- ◆ Human Kinetics; Applied Anatomy and Biomechanics in Sport, 1 Edition, Mar. 10, 2000.
- ◆ Human kinetics Canada Ltd.; Assessing Sport Skills, Mar. 6, 2001.
- ◆ Human Kinetics Canada Ltd., Coaches Guide to Drugs and Sport, 1 Edition, oct, 11, 2001.

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### ***SPSC. 522. Introduction to Orthopedic Surgery Operating Theater Sessions***--3 Cr.Hrs

- Acute Injuries (such as ankle sprain, muscle strains, knee and shoulder injuries and fractures)
- Overuse Injuries (such as tendonitis, stress fractures)
- Mild Traumatic Brain Injury and other Head Injuries
- Musculoskeletal Trauma
- Orthopedic Sport Medicine
- Surgical Sport Medicine
- Orthopedic Trauma

## References

- ◆ Knutzen Joseph Hamill, Kathleen M. Biomechanical Basis of Human Movement. February 2008,

- ◆ Verma J.P, A Text Book On Sports Statistics Published By Venus Publication in Feb. 2000
- ◆ Rout ledge; Oxygen up take Kinetics in Sports, Exercise, and Medicine, 1 Edition, Jan, 21, 2005.
- ◆ Rout ledge; Oxygen up take Kinetics in Sports, Exercise, and Medicine, 1 Edition, Jan, 21, 2005.
- ◆ Human Kinetics; Applied Anatomy and Biomechanics in Sport, 1 Edition, Mar. 10, 2000.
- ◆ Human kinetics Canada Ltd.; Assessing Sport Skills, Mar. 6, 2001.
- ◆ Human Kinetics Canada Ltd., Coaches Guide to Drugs and Sport, 1 Edition, oct, 11, 2001.

***SPSC. 523. Therapy and Rehabilitation Sciences ----- 3 Cr.Hrs***

- Cardiac /Pulmonary Rehabilitations Therapy
- Occupational/ Manual Therapy
- Physical / Dance Therapy
- Massage Therapy and Physiotherapy
- Nutritional / Sport Dietetics Therapy
- Exercise Therapy and Rehabilitations
- Mechanisms of Diseases and Principles of Chemotherapy and Radiology

**References**

- ◆ Human kinetics Canada Ltd.; Assessing Sport Skills, Mar. 6, 2001.
- ◆ Rout ledge, Skill Acquisitions in Sport: Research, Theory and Practice, 1<sup>st</sup> edition, May, 14, 2004

***SPSC. 524. Sport Nutrition ----- 3 Cr. Hrs.***

- General Principle of Nutrition
- Fuels Sources for Muscle and Exercise Metabolism
- Energy and Measuring of energy Content of food
- Nutritional Needs and Balanced foods in Sports

- Water Requirement, Macronutrients, Antioxidants, Fluid Balance in Athletes of Different Types
- Nutrition and Immune Function in Athletes

### **References**

- ◆ Saga more publishers, A Guide to Sport Nutrition, 1 Edition, Aug. 2003. Rout Ledge, Research, Ethics in Exercise, Health Science and Sport, 1 Edition, Dec. 2006.
- ◆ Bass, A.L: Treatment of Muscles, Tendon and Minor Joint Injuries in Sport, Proc. Roy. Soc. 62, 925, 1969.
- ◆ Human Kinetics; Sport Physiology, 1 Edition. Aug, 20, 2004.

## **10. Grading Schemes**

Examinations are graded on the following letter grading system with corresponding points.

[95, 100] A+	4.00
[85, 95) A	4.00
[75, 80) B+	3.50
[70, 75) B	3.00
[58, 65) C+	2.50
[50, 58) C	2.00
< 40 F	0.00

## **11. Resources**

### ***11.1. Teaching Staffs***

- a) Ph.D., 1 and 1 on study leave
- b) Ph.D., Staffs from Medical School, Department of Chemistry, Physics, and Biology
- c) M.Sc., 8
- d) Graduate Assistant I: 4
- e) Technical assistant: 3

### ***11.2. Laboratory Equipment***

- a. Swimming Pool ( needs further update)
- b. Multi – Purpose Gymnasium
- c. Modern Stadium which is under-utilized

- d. Modern Hematological Analyzer (3 compartments) expecting from the hospital
- e. Modern ECG Machine (Cardio FAX Gem) already bought
- f. Modern Ht/Wt Scale Machine and modern massage bed
- g. Materials which we are expecting to be bought

### **11.3. Required Materials**

- a) Blood Chemistry Analyzer
- b) Hormone Analyzer
- c) Surgery Operating Materials with all available Equipments
- d) Plastics Drawings and Pictures of Human Skeletal, Physiological and other necessary materials
- e) Office with full available standard furniture's, and Utilities
- f) Chemicals and Reagents

### **12. Reference Materials:**

- ◆ Andersen, N.H. and Ramwell, P.W. (1974) Biological Aspects of Post Glands. Arch. Inter. Med. 133, 30.
- ◆ Barrow, H.M and McGee, R.: "A Practical Approach to Measurement in Physical Education" Third Edn., 1979, Lea and Febiger, Philadelphia.
- ◆ Bass, A.L: Treatment of Muscles, Tendon and Minor Joint Injuries in Sport, Proc. Roy. Soc. 62, 925, 1969.
- ◆ Human Kinetics; Sport Physiology, 1 Edition. Aug, 20, 2004.
- ◆ Rout ledge; Oxygen up take Kinetics in Sports, Exercise, and Medicine, 1 Edition, Jan, 21, 2005.
- ◆ Human Kinetics; Applied Anatomy and Biomechanics in Sport, 1 Edition, Mar. 10, 2000.
- ◆ Human kinetics Canada Ltd.; Assessing Sport Skills, Mar. 6, 2001.
- ◆ Rout Ledge; Biomechanical Evaluation of Movement in Sport and Exercise; The British Association of Sport and Exercise Sciences Guide, 1 edition, Dec. 2007.
- ◆ Human Kinetics Canada Ltd., Coaches Guide to Drugs and Sport, 1 Edition, oct, 11, 2001.

- ◆ Saga more publishers, A Guide to Sport Nutrition, 1 Edition, Aug. 2003. Rout Ledge, Research, Ethics in Exercise, Health Science and Sport, 1 Edition, Dec. 2006.
- ◆ Rout ledge, Skill Acquisitions in Sport: Research, Theory and Practice, 1<sup>st</sup> edition, May, 14, 2004.
- ◆ Rout Ledge, the British Association of Sport and Exercise Guide. Port and Exercise Physiology Testing Gardenias, 1 edition, dec. 19, 2006
- ◆ Clarke H.david, H. Harrison Clarke, Research Processes in Physical Education and Health
- ◆ Peter McGinnis, Biomechanics of Sport and Exercise SBN-13: 9780736051019, Pub. Date: November 2004
- ◆ Knutzen Joseph Hamill, Kathleen M. Biomechanical Basis of Human Movement. February 2008,
- ◆ Verma J.P, A Text Book On Sports Statistics Published By Venus Publication in Feb. 2000
- ◆ Nelson Silverman, Stephen, Thomas, Jack, Research Methods in Physical Activity. ISBN-13: 9780736056205, Pub. Date: July 2005
- ◆ Singh, Hardyal (2009). Science of Sports Training, Fundamental of Sports Training



Medicine & Science in Sports & Exercise is a monthly peer-reviewed medical journal covering research in sports and exercise science. It was established in 1969 and is published by Lippincott Williams & Wilkins on behalf of the American College of Sports Medicine. Its editor-in-chief is L. Bruce Gladden (Auburn University). According to the Journal Citation Reports, the journal has a 2013 impact factor of 4.459. Sports medicine involves a wide range of professionals with functions of taking care of active population, recreational and competitive athletes upon different aspects: curative, rehabilitative and preventive. In the light of an higher demand of expertise and sport-specific burden of knowledge, such as a further development of the phenomenon doping with all the related moral, legal and health implications, the sport physician has to deal with a complex picture. For example, in Canada, a fellow must have obtained a master of science degree and published a clinical or basic science research paper (often generated from his or her thesis) [2]. On the Horizon: Defining the Future of Sports Medicine and the Role of the Physiatrist. Article. Oct 2012. Michael Fredericson. View. Each issue features original investigations, clinical studies and comprehensive reviews on current topics in sports medicine and exercise science. Key Metrics. Impact Factor: 4.478 " 6th of 83 in Sports Sciences Total Cites = 36,988 " 2nd of 83 in Sports Sciences Eigenfactor Score = 0.02898 " 3rd of 83 in Sports Sciences Cited Half-Life = 11.4 years " 10th of 83 in Sports Sciences Google Scholar h5-index = 70 " 4th in Physical Education & Sports Medicine. Featured topics include