The Bishop Strachan School
Department Name: Health and Physical Education

Course Title: Exercise Science

Grade Level: 12

Ministry Course Code: PSE4U

Teacher's Name: Donna Drover

Developed by: Donna Drover

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Developed from: The Ontario Curriculum Document, Health and Physical Education 2000- Grades 11 and 12

Text: Exercise Science, Thompson Publishing 2003

Prerequisite:
Any grade 11 University or College Preparation course in Science or any grade 11 or 12 open course in Health and Physical Education

Credits: 1.0

Length: 110 hours

Course Description/Rationale

This course focuses on the study of human movement and of systems, factors, and principles involved in human development. Students will learn about the effects of physical activity on health and performance, the evolution of physical activity and sports, and the factors that influence an individual's participation in physical activity. The course prepares students for university programs in physical education, kinesiology, recreation, and sports administration.

Overall Curriculum Expectations

The Biological Basis of Movement

1. describe the structure and function of the body and of physiological principles relating to human performance;
2. demonstrate an understanding of biomechanical principles related to improving movement;
3. demonstrate an understanding of the ways in which nutrition and training principles affect human performance;

Motor Development

4. demonstrate an understanding of individual differences in performance, growth, and development;
5. demonstrate an understanding of the principles of motor learning;

Physical Activity and Sports in Society

6. describe the evolution of physical activity and sports;
7. analyse the relationship of society and culture to sports and physical activity;

Instructional Hours Summary

Course Content Unit	Classroom Hours	Field Trip Hours	Exam Hours	Independent Study/Student Teacher Conference	Total
1. Anatomy and Physiology	**25**	**2**			**27**
2. Human Performance	**29**	**2**			**31**
3. Motor Development	**20**	**1**		**7**	**28**
4. Evolution of Physical Activity and Sports	**12**				**12**
5.Relationship of Society and Culture to Sport and Physical Activity	**12**				**12**
Total	**98**	**5**		**7**	**110**

Unit Descriptions

Unit 1 – *Anatomy and Physiology*
Students explore the anatomy and physiology of the human body using correct anatomical terminology and physiological principles to describe human performance. They demonstrate an understanding of the skeletal and muscular systems and joint mechanics related to movement. Students analyse the relationship between the cardiorespiratory and energy systems as they relate to physical activity.

Unit 2 – *Human Performance*
Students describe the relationship between nutrition and activity and investigate the effects of performance-enhancing methods and substances on human performance. Students demonstrate an understanding of the effects of training principles, technology, and environmental conditions on human performance. They use biomechanical principles to demonstrate an understanding related to improving movement.

Unit 3 – *Motor Development*
Students demonstrate an understanding of the stages of development from infancy to adulthood to help them design an age-appropriate activity. They also demonstrate an understanding of the factors that affect physical growth and development. They investigate the physical and psychological factors that affect skill performance. Students demonstrate an understanding of motor learning such as the phases of motor development and the skill acquisition process, to analyse or teach a skill.

Unit 4 – *Evolution of Physical Activity and Sports*
Students explore the world of sports and physical activity from a sociological perspective. Students demonstrate an understanding of the role of physical activity within the culture of sport and discover the evolution of sports through diverse time periods. They demonstrate an understanding of various sport-related issues, e.g., coaching, role modeling, violence in sport, exploitation in sport, equal access to sports. Students identify Canadian athletes and describe their contributions to the development of the current Canadian sport landscape.

Unit 5 – *Relationship of Society and Culture to Sports and Physical Activity*
Students demonstrate an understanding of the connections between society and culture as they influence and interact with the world of sport and physical activity. Students analyse relationships through such topics as business and sport, amateur versus professional sport, gender representation, and ethno-cultural preferences. Students describe the benefits of school and community physical activity and sports programs to themselves and to society.

Teaching/Learning Strategies

☒ Lecture	☒ Brainstorming	☒ Videotape critique
☒ Demonstration	☒ Group work	☒ Self analysis
☒ Reading	☒ Debate	☒ Peer analysis
☒ Structured discussion	☒ Panel	☒ Tutor analysis
☒ Practical exercise	☒ Seminar	☒ Teacher analysis
☒ Case study	☐ Symposium	☒ Field trip
☒ Role play	☒ Research project	☒ Game
☒ Discovery		☒ Independent study
☒ Conference		

Assessment/Evaluation Strategies

Paper and Pencil	Performance Methods	Personal Communication	Other
Tests	Projects	Interviews	Teacher anecdotal records
Works sheets	Portfolios	Conferences	Teacher log
Examinations	Presentations	Classroom discussion	Checklists
Labs	Role playing		Rubrics
	Demonstrations	Portfolio presentation	
	Diagrams	Self evaluation	
	Constructions	Peer evaluation	
	Journals		

Assessment/Evaluation

Seventy per cent (70%) of the final grade will be based on evaluations conducted throughout this course. This portion of the grade should reflect the students' ***most consistent level of achievement*** throughout this course, although special consideration should be given to the more recent evidence of achievement.
Thirty per cent (30%) of the final grade will be based on a final evaluation in the form of an examination, performance, essay, and/or other method of evaluation suitable to the course content and administered towards the end of the course.

Teachers will ensure that student work is assessed and/or evaluated in a balanced manner with respect to the four categories (see below), and that achievement of particular expectations is considered within the appropriate categories. The four categories should be considered as interrelated, reflecting the wholeness and interconnectedness of learning. The categories of knowledge and skills are:

- Knowledge and Understanding (20-30%)
- Thinking (20-30%)
- Communication (20-30%)
- Application (20-30%)

Type of Assessment	Unit Title/Length	Overall Expectations (see pg 2)	Assessment Strategies
70%	Anatomy and Physiology. 29 h	1,2,3,4,	Teacher, Self and peer evaluation of **worksheets and oral presentations**: Anatomical terminology, function and structure of the muscular and skeletal systems, Cardiorespiratory and energy systems
			Bell Ringer; skeleton
			Written tests
			Lab: cardiac output and VO2 relationships to exercise
	2.Human Performance 31h	1,2,3,4,5	Joint construction assignment/presentation
			Self and teacher assessment oral report on ergogenic aids
			Written test: training principles and human performance.
			Self, teacher and peer assessment of visual organizer outlining the Laws of Physics as they relate to movement using a checklist
	Motor Development. 31.5 h	1,2,4,5	Stages of development report using carousel
			Journal of primary school observations on a weekly basis from October to April.
			Creation of developmentally appropriate activities. Marking scheme and check list
			Peer teaching that uses motor learning principles to illustrate the stages of skill acquisition.
			Self, peer teacher assessment of the psychological, and physical factors that affect performance
	Evolution of Physical Activity and Sports 12 h/ Relationship of Society and Culture to Sports 12 h	2,4,5,6,7	Self, peer , teacher assessment: worksheet on timeline of physical activity as it pertains to females in Canada
			Societal and Cultural factors that influence sport and activity, oral presentation
			Professional Sports Amateur Sport independent research and presentation

30%		Final Assessment	*Case Study* *Portfolio Presentation* *Final Journal Entry/Reflection*
			Total

Course Resources

Exercise Science An Introduction to Health and Physical Education. Ted Temertzoglou and Paul Challen. Thompson Publishing 2003

Baechle, T. R. and R.W. Earle. *Essentials of Strength Training and Conditioning*. Windsor: Human Kinetics, 2000. ISBN 0-7360-0089-5

Bompa, T.O. and L.J. Cornacchia. *Serious Strength Training*. Toronto: Human Kinetics, 1998. ISBN 0-88011-834-2

Cardiovascular System: Interactive Physiology. A.D.A.M. Software Inc., 1997. Toronto: Benjamin Cummings. – www.adam.com

Floyd, R.T. and C.W. Thompson. *The Manual of Structural Kinesiology*, 14th ed. Toronto: McGraw-Hill, 2001. ISBN 0-07-232917-3

Florida State University College of Medicine – http://www.medlib.med.utah.edu/WebPath/CVHTML/CVIDX.html

Gatorade Sports Science Institute. (GSSI) – http://www.gssiweb.com/

Hosford Web Service. Berrien Springs, Michigan – http://www.ptcentral.com/muscles/

Human Anatomy Online 2000 – http://www.ttuhsc.edu/courses/cbb/ha/index.htm

Human Kinetics, Windsor, Ontario – http://www.humankinetics.com/index.cfm

Innerbody Intellimed My Health Score Phoenix, Arizona – http://innerbody.com/htm/sysselec.html

Kapit, W. and L.M. Elson. *The Anatomy Colouring Book*, 3rd ed. Toronto: Benjamin Cummings, 2001. ISBN 0-8053-5086-1

Loyola University Medical Education Network – http://www.meddean.luc.edu/lumen/MedEd/grossanatomy/learnem/learnit.htm

MedFacts/TeleVisualCommunications – http://www.medfacts.com/medlib.htm

Murray Jensen General College, University of Minnesota. Web Anatomy – http://www.gen.umn.edu/faculty_staff/jensen/1135/webanatomy/

Muscular System: Interactive Physiology. A.D.A.M. Software Inc., 1997. Toronto: Benjamin Cummings – www.adam.com

Nervous System 1: Interactive Physiology. A.D.A.M. Software Inc., 1997. Toronto: Benjamin Cummings

Robertson, T. and S. Glover. *Senior physical education, revised edition.* Malvern, Australia: Coghill Publishing. ISBN 949168 71 8

Shier, D., J. Butler, and R. Lewis. *Hole's essentials of human anatomy and physiology*, 7th ed. U.S.A: McGraw-Hill Higher Education. ISBN 0-07-290775-4

Stephen, S. 1996. The Institute for Sport, Agder College, Kristiansand, Norway. – http://home.hia.no/~stephens/exphys.htm

The Franklin Institute Science Museum. Philadelphia, Pennsylvania.
– http://www.fi.edu/biosci/preview/heartpreview.html

The Physician and Sportsmedicine Online 2002. The McGraw-Hill Companies.
– http://www.physsportsmed.com/

University of Arkansas for Medical Sciences Department of Anatomy
– http://anatomy.uams.edu/HTMLpages/anatomyhtml/medcharts.html

University of Michigan. Joint Movements.
– http://www.med.umich.edu/lrc/Hypermuscle/Hyper.html#flex\

University of California at San Diego.2000.
– http://www-neuromus.ucsd.edu/MusIntro/Jump.html

Achievement Chart – Health and Physical Education, Grades 9–12

Categories	50–59% (Level 1)	60–69% (Level 2)	70–79% (Level 3)	80–100% (Level 4)
Knowledge and Understanding *Subject-specific content acquired in each grade (knowledge), and the comprehension of its meaning and significance (understanding)*				
	The student:			
Knowledge of content (e.g., foundational skills, facts, terms, characteristics, symbols)	– demonstrates limited knowledge of content	– demonstrates some knowledge of content	– demonstrates considerable knowledge of content	– demonstrates thorough knowledge of content
Understanding of content (e.g., ideas, processes, relationships, techniques, strategies, principles, patterns, concepts)	– demonstrates limited understanding of content	– demonstrates some understanding of content	– demonstrates considerable understanding of content	– demonstrates thorough understanding of content
Thinking *The use of critical and creative thinking skills and/or processes*				
	The student:			
Use of planning skills (e.g., focusing research, gathering information, organizing an inquiry)	– uses planning skills with limited effectiveness	– uses planning skills with some effectiveness	– uses planning skills with considerable effectiveness	– uses planning skills with a high degree of effectiveness
Use of processing skills (e.g., analysing, generating, integrating, synthesizing, evaluating, forming conclusions)	– uses processing skills with limited effectiveness	– uses processing skills with some effectiveness	– uses processing skills with considerable effectiveness	– uses processing skills with a high degree of effectiveness
Use of critical/creative thinking processes (e.g., goal setting, decision making, problem solving, conflict resolution)	– uses critical/creative thinking processes with limited effectiveness	– uses critical/creative thinking processes with some effectiveness	– uses critical/creative thinking processes with considerable effectiveness	– uses critical/creative thinking processes with a high degree of effectiveness
Communication *The conveying of meaning through various forms*				
	The student:			
Expression and organization of ideas and information (e.g., clarity of expression, logical organization) in oral, visual, and written forms (e.g., *oral:* role plays, interviews, presentations; *visual:* posters, collages, graphic organizers, electronic representations; *written:* pamphlets, flyers, journals, fitness plans, reports)	– expresses and organizes ideas and information with limited effectiveness	– expresses and organizes ideas and information with some effectiveness	– expresses and organizes ideas and information with considerable effectiveness	– expresses and organizes ideas and information with a high degree of effectiveness

Categories	50–59% (Level 1)	60–69% (Level 2)	70–79% (Level 3)	80–100% (Level 4)
Communication ***(cont.)***				
	The student:			
Communication for different audiences (e.g., self, peers, teachers, community) and purposes (e.g., to inform, instruct, persuade) in oral, visual, and written forms	– communicates for different audiences and purposes with limited effectiveness	– communicates for different audiences and purposes with some effectiveness	– communicates for different audiences and purposes with considerable effectiveness	– communicates for different audiences and purposes with a high degree of effectiveness
Use of conventions, vocabulary, and terminology of the discipline in oral, visual, and written forms	– uses conventions, vocabulary, and terminology of the discipline with limited effectiveness	– uses conventions, vocabulary, and terminology of the discipline with some effectiveness	– uses conventions, vocabulary, and terminology of the discipline with considerable effectiveness	– uses conventions, vocabulary, and terminology of the discipline with a high degree of effectiveness
Application *The use of knowledge and skills to make connections within and between various contexts*				
	The student:			
Application of knowledge and skills in familiar contexts – fundamental movement skills – principles of movement, sports strategies – interpersonal skills (e.g., team work, fair play, leadership) – health concepts	– applies knowledge and skills in familiar contexts with limited effectiveness	– applies knowledge and skills in familiar contexts with some effectiveness	– applies knowledge and skills in familiar contexts with considerable effectiveness	– applies knowledge and skills in familiar contexts with a high degree of effectiveness
Transfer of knowledge and skills to new contexts – fundamental movement skills – principles of movement, sports strategies – interpersonal skills (e.g., team work, fair play, leadership) – health concepts	– transfers knowledge and skills to new contexts with limited effectiveness	– transfers knowledge and skills to new contexts with some effectiveness	– transfers knowledge and skills to new contexts with considerable effectiveness	– transfers knowledge and skills to new contexts with a high degree of effectiveness
Making connections within and between various contexts (e.g., between health concepts, personal development, physical fitness, active participation, safe practices, and healthy living)	– makes connections within and between various contexts with limited effectiveness	– makes connections within and between various contexts with some effectiveness	– makes connections within and between various contexts with considerable effectiveness	– makes connections within and between various contexts with a high degree of effectiveness