Bergen Community College
Division of Health Professions
Paramedic Science Program
Fall 2014

PAR 101-001	**Principles of Paramedic Science I**
Meeting Times:	Thursday 8:00a-12:00p
Locations:	Meadowlands Campus P111
Instructor:	Professor McCarthy
Office Location:	P111
Phone:	201-301-1592
Office Hours:	Tuesday and Wednesday 9:30 – 11:30 and by appointment
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Course Description:
This course provides students with the foundation principles of pre-hospital emergency medical care. Students will explore body systems and the pathophysiology that causes a patient to experience the life-threatening ailments that requires them to call 9-1-1. Lecture 4.00].
Pre-requisite: NJ EMT license, Bio 109, BIO 209, MAT elective, PSY101, PSY201, SOC101, WRT 101, WRT 201 or WRT 202
Corequisite[s]: PAR-102, PAR-103, PAR-104.

Paramedic Program Core Competencies:

A. Ethics and EMS Structure

A1. Exhibit a professional code of conduct with personal and professional integrity.
A1. Provide compassionate care to all populations while respecting cultural differences.
A3. Comply with all state and federal regulation/laws for an entry-level paramedic.

B. Patient Assessment and Skills

B1. Utilize a systematic assessment to determine appropriate modalities for medical and trauma patients of all ages while prioritizing interventions needed to improve patient outcomes.
B2. Demonstrate skill proficiency in all entry-level psychomotor skills, utilizing them when clinically appropriate and at the correct time to improve patient outcomes.
B3. Function as a member of the paramedic team by using effective communication and proper behavior that promotes customer service and efficient care.

C. Safety and Personal Wellness

C1. Correctly identifies potential hazards to promote a safe environment for self, co-workers, patients and bystanders.
C2. Uses critical thinking skills to properly manage and diffuse stressful environments.
C3. Identifies personal stress and utilizes stress management techniques to ensure physical and emotional health.

Student Learning Objectives:
Upon completion of this course, the student will be able to:

EMS System Design – Roles and Responsibilities
Integrate comprehensive knowledge of EMS systems, safety/wellbeing of the paramedic, and medical/legal and ethical issues, which are intended to improve the health of EMS personnel, patients, and the community.

Workforce Safety and Wellness
Integrate comprehensive knowledge of EMS systems, safety/well-being of the paramedic, and medical/legal and ethical issues, which are intended to improve the health of EMS personnel, patients, and the community.

Patient Safety
Integrate comprehensive knowledge of EMS systems, safety/well-being of the paramedic, and medical/legal and ethical issues, which are intended to improve the health of EMS personnel, patients, and the community.

Pharmacology
Integrate comprehensive knowledge of pharmacology to formulate a treatment plan intended to mitigate emergencies and improve the overall health of the patient.

Patient Exam and Differential Diagnosis
Integrate scene and patient assessment findings with knowledge of epidemiology and pathophysiology to form a field impression. This includes developing a list of differential diagnoses through clinical reasoning to modify the assessment and formulate a treatment plan.

Venous Access and Medication Administration
Integrate comprehensive knowledge of pharmacology to formulate a treatment plan intended to mitigate emergencies and improve the overall health of the patient.

Fluid and Lytes
Integrate comprehensive knowledge of pathophysiology of major human systems.

Research
Integrate comprehensive knowledge of EMS systems, safety/well-being of the paramedic, and medical/legal and ethical issues, which are intended to improve the health of EMS personnel, patients, and the community.

Cardiology
Integrate assessment findings with principles of epidemiology and pathophysiology to formulate a field impression and implement a comprehensive treatment/disposition plan for a patient with a medical complaint.

Burns
Integrate assessment findings with principles of epidemiology and pathophysiology to formulate a field impression to implement a comprehensive treatment/disposition plan for an acutely injured patient.

Trauma Overview
Integrate assessment findings with principles of epidemiology and pathophysiology to formulate a field impression to implement a comprehensive treatment/disposition plan for an acutely injured patient.

Instructional Resources
Available in the library and computer labs

Annals of Emergency Medicine
Journal of Emergency Medical Services (JEMS)
Journal of Accident and Emergency Medicine
New England Journal of Medicine
Pre-Hospital Emergency Care Journal

Means of Assessment
In accordance with accreditation standards, students will be provided with ample feedback to allow them the ability to improve performance in cognitive, psychomotor and affective domains of learning.

Quizzes (3)	30%
Participation on Moodle	10%
Tests (2)	20%
Patient Case Studies (1)	10%
Comprehensive Final Written Exam (1)	30%

Moodle Structure:
The delivery platform for this course is a hybrid format utilizing a Moodle program. Students must fully participate in both online and on campus components of the course to successfully complete the course.

The Moodle structure will provide opportunities for discussion boards, email communication, class announcements, online patient cases, and completion of tests and quizzes.

Course Menu in Moodle:
- Online Syllabus
- Course Announcements
- Forums
- Assignments
- Email
- My grades

Recommended Practice
To effectively manage this course for successful completion, you should do the following:

- Read and follow the course syllabus by adhering to the assigned dates of completion
- Read the messages under "Course Announcements"
- Follow the course calendar in Moodle
- Timely complete and submit all assignments – late assignments will not be accepted!
- Use the email communication platform to communicate with other students and the instructor.
- Actively participate in class and in online discussions

Course Content
This course will offer students the ability to gain cognitive knowledge related to patient care principles. The majority of the class will require students to work individually. Occasional group assignments may be utilized. Students will obtain clinical skill knowledge and competency prior to entering a clinical rotation.

Special Features of the Course
Pass Rate:
The Paramedic Department pass rate is an 80%. Students are required to obtain a final average of an 80% in each core curriculum course. At the end of the semester, any student not achieving an 80% will be unable to continue in the program.

Squad Assignments
Students will be assigned to squads of no more than 6 students. The purpose of the squad is to promote teamwork, provide peer support and offer organization structure to the course. Students will take turns being the squad leader. The structure of squads will help instill comfort for the students prior to them being required to function in a clinical affiliate paramedic unit where teamwork and communication is paramount.

Course Texts
Required Text:
American Heart Association. ***Advanced Cardiovascular Life Support Handbook***, April 2011, American Heart Association Incorporated (ISBN – 978-1-6166-9000-7)
Jones Bartlett ***Premier Bundle Package 2.0*** (ISBN: 9781284038316)
Jones Bartlett ***Bergen Medic Package*** (ISBN 9781284059342)

Optional Text:
Walls, Ron. Manual of Emergency Airway Management, 4th Edition, 2012, Lippincott, Williams and Wilkins. (ISBN 9781451144918)

Research, Writing and Examination Requirements
Students will be required to develop patient case studies that effectively depict a common medical emergency. Requirements will include appropriate description of signs, symptoms, patient presentation, pertinent medical history, medications and/or recent surgeries. Student will present their case to group. An affective behavior assessment will be included in the patient case study grade.

Grading Scale

A	93-100
B+	89-92
B	85-88
C+	82-84
C	80-81
F	Below 80
N	Incomplete (course requirements not fulfilled)

Academic Conduct

The paramedic program faculty adheres to the policy statement governing academic conduct as outlined in the Bergen Community College catalog.

- Faculty may not post exam grades publicly due to privacy laws.
- Scholastic dishonesty including but not limited to plagiarism, cheating, and collusion will not be tolerated. Any student who has demonstrated any of these behaviors will be disciplined according to the Policy and Procedure Manual of the program.

Attendance Policy

Please refer to the Paramedic Policy Manual for exact absence policy information.

The Commission on Accreditation of Allied Health Education Programs (CAAHEP) requires that students meet a minimum number of didactic/lab, clinical and field internship hours. Therefore students are expected to attend all class sessions.

No make-up quizzes, tests or exams will be given. Any student who is absent for a quiz, test, or exam will receive a grade of "0".

Students will be allowed one excused absence per semester for all four PAR courses. An absence is considered excused when a student notifies the professor prior to the start of class that they will be absent. Any additional absences will negatively affect the student's grade. For each unexcused absence the final grade will reduce by 1 point. For each excused absence the final grade will reduce by 0.5 point.

Tardiness will not be tolerated. In accordance with New Jersey state regulation, an attendance sheet will be available at the beginning of the class. If a student is tardy 3 times it will be calculated as an unexcused absence.

Other College, School and/or Departmental Policy Statements

The Paramedic Program is accredited by two agencies, The Commission on Accreditation of Allied Health Education Programs (CAAHEP) and the New Jersey Department of Health and Human Service – Office of Emergency Medical Services.

The Bergen Community College Paramedic Science Program has been issued a Letter of Review by the Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions (CoAEMSP). This letter is NOT a CAAHEP accreditation status, it is a status signifying that a program seeking initial accreditation has demonstrated sufficient compliance with the accreditation Standards through the Letter of Review Self Study Report (LSSR) and other documentation. Letter of Review is recognized by the National Registry of Emergency Medical Technicians (NREMT) for eligibility to take the NREMT's Paramedic credentialing examination(s). However, it is NOT a guarantee of eventual accreditation.

To contact CoAEMSP:
8301 Lakeview Parkway Suite 111-312
Rowlett, TX 75088
214-703-8445
FAX 214-703-8992
www.coaemsp.org

The Paramedic Department Policy and Procedure Manual has been reviewed at orientation. The purpose of the manual is to clearly outline the role and responsibility of each stakeholder in the education process; the student, the patient, the faculty, the clinical affiliate and the college. Students and faculty are expected to adhere to the policies of the program.

Student and Faculty Services
Students are encouraged to seek assistance from peers and/or faculty members whenever they are having difficulties with the program curriculum. The Paramedic Science Program is structured to ensure the needs of the paramedic student will be met. There will be open skill labs and simulation sessions available to allow students to access adjunct faculty for support with any learning difficulties. Peer tutors will be utilized to facilitate further success in the program.

Americans with Disabilities Act
Students who require accommodations in accordance with Americans with Disabilities Act (ADA) can request these services form the Office of Specialized Services. To learn more about the services offered at Bergen Community College, visit them at www.bergen.edu/oss.

Course calendar:

Week	Topic	Assignment
1	Course Orientation: EMS System Overview, EMS Roles & Responsibilities	*Emergency Care in the Streets* Chapter 1 and 2
2	Anatomy and Physiology Review	*Emergency Care in the Streets* Chapter 7
3	Emergency Pharmacology, Meds and Math Quiz #1	*Emergency Care in the Streets* Chapter 11 and 12

4	Communication Techniques	*Emergency Care in the Streets* Chapter 5
5	Venous Access	*Emergency Care in the Streets* Chapter 11
6	Fluid and Lytes Test #1	*Emergency Care in the Streets* Chapter 7
7	Evidence Based Research	*Emergency Care in the Streets* Chapter 3
8	Cardiac Pathophysiology Quiz #2	*Emergency Care in the Streets* Chapter 27
9	Heart blocks Differentiated Cardiac Assessment	*Emergency Care in the Streets* Chapter 17
10	Cardiac Pharmacology Hemo-compromised Rhythms	*Emergency Care in the Streets* Chapter 17
11	12 Lead Quiz #3	
12	Off Holiday	
13	Spinal Cord Injury Traumatic Brain Injury Soft tissue Injury Test #1	*Emergency Care in the Streets* Chapter 34 *Advanced Trauma Life Support* Chapter 9
14	Patient Perspective on Trauma Review for Final	
15	Final Exam	

Syllabus Subject to Change

Unit Objectives:

As a result of meeting the requirements in this course, students will be able to:

EMS System Design – Roles and Responsibilities

1. Define the following terms:
    a. EMS Systems
    b. Licensure
    c. Certification
    d. Registration
    e. Profession
    f. Professionalism
    g. Health care professional
    h. Ethics
    i. Peer review
    j. Medical direction
    k. Protocols
2. Describe key historical events that influenced the development of national Emergency Medical Services (EMS) systems.
3. Identify national groups important to the development, education, and implementation of EMS.
4. Differentiate among the four nationally recognized levels of EMS training/ education, leading to licensure/ certification/ registration.
5. Describe the attributes of a paramedic as a health care professional.
6. Describe the recognized levels of EMS training/ education, leading to licensure/ certification in his or her state.
7. Explain paramedic licensure/ certification, recertification, and reciprocity requirements in his or her state.
8. Describe the benefits of paramedic continuing education.
9. List current state requirements for paramedic education in his/ her state.
10. Discuss current issues in his/ her state impacting EMS.
11. Discuss the roles of various EMS standard setting agencies.
12. Identify the standards (components) of an EMS System as defined by the National Highway Traffic Safety Administration.
13. Describe how professionalism applies to the paramedic while on and off duty.
14. Describe examples of professional behaviors in the following areas:
    a. Integrity
    b. Empathy
    c. Self-motivation
    d. Appearance and personal hygiene
    e. Self-confidence
    f. Communications
    g. Time management
    h. Teamwork and diplomacy
    i. Respect
    j. Patient advocacy
    k. Careful delivery of service
15. Provide examples of activities that constitute appropriate professional behavior for a paramedic.
16. Describe the role of the EMS physician in providing medical direction.
17. Describe the benefits of medical direction, both on-line and off-line.
18. Describe the process for the development of local policies and protocols.

19. Provide examples of local protocols.
20. Discuss prehospital and out-of-hospital care as an extension of the physician.
21. Describe the relationship between a physician on the scene, the paramedic on the scene, and the EMS physician providing on-line medical direction.
22. Describe the components of continuous quality improvement.
23. Analyze the role of continuous quality improvement with respect to continuing medical education and research.

Anatomy and Physiology/Human Body Function and Structure

1. Discuss the importance of anatomy as it related to the paramedic profession
2. Discuss each of the major organ systems in the human body focusing on the Pulmonary, Cardiac, Neurological and Renal Systems
3. Distinguish pathophysiology of respiratory emergencies related to ventilation, diffusion and perfusion.
4. Describe causes, complications, signs and symptoms, and pre-hospital management for the major respiratory ailments.
5. Identify risk factors and preventative strategies associated with cardiovascular disease
6. Describe the normal physiology of the heart
7. Label a diagram of the heart
8. Label a diagram of blood flow through the heart
9. Outline appropriate assessment of a patient who may be experiencing a cardiovascular disorder
10. Describe pre-hospital assessment and management of patients with specific cardiovascular disorders
11. Describe anatomy and physiology of the nervous system
12. Outline pathophysiological changes in the nervous system that may alter perfusion
13. Describe an assessment of a patient with a neural disorder
14. Label a diagram of the urinary system
15. Describe the pathophysiology of urinary disorders
16. Discuss pharmacological agents specific to respiratory, cardiac, neural and renal disorders.

Pathophysiology

1. Describe normal cell function
2. Outline electrolyte balance and imbalance
3. Describe the treatment of patients with electrolyte imbalance
4. Describe the mechanism of acid base balance and appropriate treatment there of
5. Outline the effects of cellular injury on local and systemic body functions
6. Outline the causes and compensatory mechanisms associated with hypoperfusion

Pharmacology

1. List and describe the actions and uses for pharmaceutical agents
2. Review the mathematical equations used for drug calculation
3. Outline autonomic nervous system function that can be altered by drug therapy
4. Discuss factors that influence and affect drug absorption, distribution, and elimination
5. Explain the meaning of drug terms that are necessary to safely interpret information in drug reference

Patient Exam and Differential Diagnosis

1. Understand Assessment approach and technique
2. Define a complete Physical Examination

3. Outline the elements of effective therapeutic communication
4. Outline the elements of an effective patient interview
5. Summarize strategies to gather appropriate patient information
6. Summarize strategies to enhance communication in special situations
7. Describe the purpose of effective history taking technique
8. List components of the patient history
9. Outline the critical steps in initial patient assessment
10. Discuss interventions for life-threatening conditions
11. Identify the components of a focused history and physical exam
12. Describe on going assessment
13. Distinguish priorities in the care of medical versus trauma patients

Venous Access and Medication Administration

1. Identify steps used to perform drug dosage calculation
2. Calculate the correct volume of drug to be administered in a given situation
3. Compute the correct rate for an infusion of drugs for intravenous fluids
4. Describe the steps to safely initiate an Intravenous Infusion
5. Identify complication and adverse effects associated with intravenous access
6. Explain techniques of drug administration by percutaneous routes
7. Describe the technique to obtain a venous blood sample

Fluid and Lytes

1. Review the specific anatomy and physiology pertinent to medication administration.
2. Describe the technique to obtain a venous blood sample.
3. Define Osmosis and Diffusion.
4. Describe the shock cascade.
5. Define coping mechanisms related to fluid loss.
6. Describe what will happen to a cell when placed in a hypotonic, hypertonic or isotonic solution.
7. List at least seven functions of blood.
8. Describe the function of platelets.
9. Describe the contents of and function of plasma.
10. Name the amount of liters of blood in the normal adult.
11. List at least four functions of the lymphatic system.
12. Give an accurate definition of hemoglobin including the normal value.
13. Describe in general terms the process of blood clotting and wound healing.
14. List the four blood types and identify the universal donor and recipient.
15. Give an accurate definition of hemoglobin and hematocrit including normal percentages for male and female.

Research

1. Define scientific evidence.
2. Describe ways to confirm that a study is of sound basis.
3. Describe the importance and benefits of research.
4. Explain the EMS provider's role in data collection.
5. Explain the basic principles of research.
6. Describe a process of evaluating and interpreting research.
7. Describe the importance of quality EMS research to the future of EMS.

Cardiology

1. Differentiate among the primary mechanisms responsible for producing cardiac arrhythmias.
2. Describe a systematic approach to the analysis and interpretation of cardiac arrhythmias.
3. Identify the characteristics of atrial, junctional, heart blocks and ventricular dysrhythmias.
4. Describe the arrhythmias originating or sustained in the AV junction.
5. Describe the abnormalities originating within the bundle branch system.
6. Describe the process of differentiating wide QRS complex tachycardia.
7. Recognize the pitfalls in the differentiation of wide QRS complex tachycardia.
8. Describe the conditions of pulseless electrical activity.
9. Describe the phenomena of reentry, aberration and accessory pathways.
10. Identify the ECG changes characteristically produced by electrolyte imbalances and specify the clinical implications.
11. Identify patient situations where ECG rhythm analysis is indicated.
12. Recognize the changes on the ECG that may reflect evidence of myocardial ischemia and injury.
13. Recognize the limitations of the ECG in reflecting evidence of myocardial ischemia and injury.
14. Correlate abnormal ECG findings with clinical interpretation.
15. Identify the major therapeutic objectives in the treatment of the patient with any arrhythmia.
16. List indications, contraindications and side effects of cardiac pharmacological agents.
17. Identify the major mechanical, pharmacological and electrical therapeutic interventions.
18. Based on field impressions, identify the need for rapid intervention for the patient in cardiovascular compromise.
19. Describe the incidence, morbidity and mortality associated with myocardial conduction defects.
20. List indications, contraindications, and side effects of cardiac pacing.
21. Describe the components and the functions of a transcutaneous pacing system.
22. Explain what each setting and indicator on a transcutaneous pacing system represents and how the settings may be adjusted.
23. Describe the techniques of applying a transcutaneous pacing system.
24. Describe the characteristics of an implanted pacemaker system.
25. Describe artifacts that may cause confusion when evaluating the ECG of a patient with a pacemaker.
26. List the possible complications of pacing.
27. List the causes and implications of pacemaker failure.
28. Identify additional hazards that interfere with artificial pacemaker function.
29. Recognize the complications of artificial pacemakers as evidenced on ECG.
30. Describe the most commonly used pharmacological agents in the managements of cardiac arrest in terms of therapeutic effects.
31. Differentiate between signs and symptoms of:
    a. Cardiac tamponade
    b. Hypertensive emergencies
    c. Cardiogenic shock
    d. Cardiac arrest.

Burns

1. Describe the incidence, patterns and sources of burns
2. Describe the pathophysiology of local and systemic response to burn injury
3. Classify burn injury according to national standards

4. Outline the physical examination of a burned patient
5. Describe the pre-hospital management of a patient who has sustained a burn
6. Discuss the pathophysiology and management of a patient who has sustained inhalation injury
7. Outline the general management for a patient who has a chemical burn
8. Describe the physiological effects of electrical burns
9. Understand the key principles of electricity
10. Outline the assessment and management of a patient with electrical injury

Soft Tissue Injury

1. Describe the pathophysiological response to soft tissue trauma
2. Describe mechanisms of injury of specific soft tissue injuries
3. Outline management principles for pre-hospital care for soft tissue injury
4. Describe the correct sequence management to control hemorrhaging
5. Describe the pre-hospital management of selected soft tissue injuries

Trauma Overview

1. Describe mechanism of injury, assessment and management of maxillofacial injury
2. Describe mechanism of injury, assessment and management of ear, eye and dental injury
3. Describe mechanism of injury, assessment and management of anterior neck injury
4. Describe mechanism of injury, assessment and management of scalp, cranial vault and cranial nerves
5. Distinguish between the types of traumatic brain injury based upon an understanding of pathophysiology and assessment findings
6. Outline the pre-hospital management of a patient with cerebral injury
7. Calculate a Glasgow Coma Scale when given appropriate patient information
8. Describe the incidence, mortality, morbidity related to spinal cord trauma
9. Predict mechanisms of injury that are likely to cause spinal cord injury
10. Outline the general assessment of a patient with suspected spinal injury
11. Distinguish between types of spinal injury
12. Describe pre-hospital evaluation, assessment, and management of patients with spinal cord injury
13. Describe specific non traumatic spinal cord conditions and the pre-hospital assessment and management of them
14. Discuss the epidemiology and mechanism of thoracic trauma
15. Describe the mechanism of injury, assessment and management of injuries to the chest
16. Describe mechanism of injury, assessment and management of pulmonary trauma
17. Describe mechanism of injury, assessment and management of trauma to the great vessels and the heart
18. Given a specific scenario outline the pre-hospital assessment and management of musculoskeletal injuries
19. Outline general principles of splinting
20. Identify pre-hospital management priorities for open fractures

All syllabus and course calendars are subject to change.