



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2023/2024		
MASTER'S DEGREE (MSC)	MEDICINE AND SURGERY		
INTEGRATED COURSE	PHYSICS AND STATISTICS - INTEGRATED COURSE		
CODE	19651		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	MED/01, FIS/07		
HEAD PROFESSOR(S)	CASCIO DONATO	Professore Associato	Univ. di PALERMO
	MARRALE MAURIZIO	Professore Associato	Univ. di PALERMO
	BARTOLOTTA ANTONIO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	MATRANGA DOMENICA	Professore Ordinario	Univ. di PALERMO
	ENEA MARCO	Professore Associato	Univ. di PALERMO
	CASCIO DONATO	Professore Associato	Univ. di PALERMO
	MANISCALCO LAURA	Ricercatore a tempo determinato	Univ. di PALERMO
	MARRALE MAURIZIO	Professore Associato	Univ. di PALERMO
	BARTOLOTTA ANTONIO	Professore Ordinario	Univ. di PALERMO
CREDITS	8		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	BARTOLOTTA ANTONIO Wednesday 09:00 10:00 via Archirafi 38.E' necessario chiedere appuntamento almeno due giorni prima via e-mail (antonio.bartolotta@unipa.it) Thursday 09:00 10:00 via Archirafi 38.E' necessario chiedere appuntamento almeno due giorni prima via e-mail (antonio.bartolotta@unipa.it) CASCIO DONATO Tuesday 16:00 18:00 -- Il ricevimento viene effettuato su teams. Si prega di richiedere appuntamento almeno due giorni prima via email (donato.cascio@unipa.it), indicando il Corso di Laurea di appartenenza. ENEA MARCO Monday 15:00 17:00 Dipartimento PROMISE - Sezione di Igiene - Università degli Studi di Palermo - Via del Vespro, 133, Palermo. Stanza del Docente. Si consiglia di contattare il docente per un appuntamento. MARRALE MAURIZIO Thursday 15:00 17:00 Dipartimento di Fisica e Chimica "Emilio Segre" Viale delle Scienze, Edificio 18. Tel diretto 09123899073. Si prega di richiedere appuntamento almeno tre giorni prima via e-mail (maurizio.marrale@unipa.it). MATRANGA DOMENICA Friday 12:00 13:30 Stanza della docente, Dipartimento di Promozione della Salute, Materno-Infantile, Medicina interna e specialistica di eccellenza "G. D'Alessandro", Via del Vespro, 133, piano terra		

DOCENTE: Prof. ANTONIO BARTOLOTTA- *Sede CHIRONE*

PREREQUISITES	Mathematical knowledge of the programs of high school.
LEARNING OUTCOMES	Capacity to describe the natural phenomena on the basis of physical laws. Knowledge and comprehension of the physical laws that describes natural phenomena. Ability to comment critically and autonomously natural phenomena with mathematical tools and physics laws.
ASSESSMENT METHODS	For Physics the exam will composed of multiple choice questions and oral exam. The exam consists of a written test and an interview which is accessed after passing the written test. The written test consists of 10 multiple choice exercises; the minimum score to access the interview is 15/30; the available time is 100 minutes. Interview: the candidate will have to answer at some questions, on all parts of the program, with reference to the recommended texts. The final evaluation will be made appropriately balancing the result of the written test and of the interview. For Statistics, the exam will be a multiple-choice test, with evaluation in thirtieths. The student or the Exam Commission could ask for an additional oral exam. Valuation ranking from 18/30 for elementary knowledge up to 30/30 cum laude for excellent knowledge.
TEACHING METHODS	Lectures and classroom exercises

DOCENTE: Prof. DONATO CASCIO- *Sede HYPATIA*

PREREQUISITES	Mathematical knowledge of the programs of high school.
LEARNING OUTCOMES	Capacity to describe the natural phenomena on the basis of physical laws. Knowledge and comprehension of the physical laws that describes natural phenomena. Ability to comment critically and autonomously natural phenomena with mathematical tools and physics laws.
ASSESSMENT METHODS	For Physics the exam will composed of multiple choice questions and oral exam. The exam consists of a written test and an interview which is accessed after passing the written test. The written test consists of 10 multiple choice exercises; the minimum score to access the interview is 15/30; the available time is 100 minutes. Interview: the candidate will have to answer at some questions, on all parts of the program, with reference to the recommended texts. The final evaluation will be made appropriately balancing the result of the written test and of the interview. For Statistics, the exam will be a multiple-choice test, with evaluation in thirtieths. The student or the Exam Commission could ask for an additional oral exam. Valuation ranking from 18/30 for elementary knowledge up to 30/30 cum laude for excellent knowledge.
TEACHING METHODS	Lectures and classroom exercises

DOCENTE: Prof. MAURIZIO MARRALE- *Sede IPPOCRATE*

PREREQUISITES	Mathematical knowledge of the programs of high school.
LEARNING OUTCOMES	Capacity to describe the natural phenomena on the basis of physical laws. Knowledge and comprehension of the physical laws that describes natural phenomena. Ability to comment critically and autonomously natural phenomena with mathematical tools and physics laws.
ASSESSMENT METHODS	For Physics the exam will composed of multiple choice questions and oral exam. The exam consists of a written test and an interview which is accessed after passing the written test. The written test consists of 10 multiple choice exercises; the minimum score to access the interview is 15/30; the available time is 100 minutes. Interview: the candidate will have to answer at some questions, on all parts of the program, with reference to the recommended texts. The final evaluation will be made appropriately balancing the result of the written test and of the interview. For Statistics, the exam will be a multiple-choice test, with evaluation in thirtieths. The student or the Exam Commission could ask for an additional oral exam. Valuation ranking from 18/30 for elementary knowledge up to 30/30 cum laude for excellent knowledge.
TEACHING METHODS	Lectures and classroom exercises

MODULE PHYSICS

Prof. ANTONIO BARTOLOTTA - Sede CHIRONE, - Sede CHIRONE

SUGGESTED BIBLIOGRAPHY

R.A. Serway: Fondamenti di fisica. 2022. EdiSES. 9788836230730
 A. Bartolotta: Meccanica dei fluidi. EdiSES. ISBN:978-8879598750
 A. Lascialfari, F. Borsa, A.M. Gueli: Principi di Fisica per indirizzo biomedico e farmaceutico. EdiSES. ISBN:978-8836230204
 D.C. Giancoli: Fisica (principi e applicazioni). CEA: ISBN: 978-8808880000
 R.A. Serway, J.W. Jewett: Guida allo studente e alla risoluzione dei problemi di Principi di Fisica. EdiSES. ISBN: 978-8879592871
 D. Scannicchio: Fisica Biomedica. EdiSES. ISBN: 978-8879597814 (da consultare per le applicazioni in Fisica Medica)

AMBIT	50400-Discipline generali per la formazione del medico
INDIVIDUAL STUDY (Hrs)	75
COURSE ACTIVITY (Hrs)	50

EDUCATIONAL OBJECTIVES OF THE MODULE

Ability to present the results of experiments with functions and graphics.
 Capacity to continue studies using the basic training received in the course.

SYLLABUS

Hrs	Frontal teaching
2	Basic and derived physical quantities. The international system of units
10	Speed, acceleration, forces. Laws of motion. Kinetic and potential energy. Conservative forces. Conservation of mechanical energy. Momentum.
12	Hydrostatic laws. Hydrodynamics of perfect and real fluids. Surface tension
12	Thermodynamics. Temperature and heat transfer. Internal energy and the first law of thermodynamics. Heat engines, second law of thermodynamics, entropy
10	Columb law. Electric field, potential, capacitance of a capacitor, dielectrics, Ohm laws. Magnetic field, Lawrence force.
4	Waves. Electromagnetic spectrum, photons. Radioactivity, applications of ionizing radiation in Diagnostic and therapy.

MODULE PHYSICS

Prof. DONATO CASCIO - Sede HYPATIA, - Sede HYPATIA

SUGGESTED BIBLIOGRAPHY

R.A. Serway: Fondamenti di fisica. 2022. EdiSES. 9788836230730
 A. Bartolotta: Meccanica dei fluidi. EdiSES. ISBN:978-8879598750
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10	Columb law. Electric field, potential, capacitance of a capacitor, dielectrics, Ohm laws. Magnetic field, Lawrence force.
4	Waves. Electromagnetic spectrum, photons. Radioactivity, applications of ionizing radiation in Diagnostic and therapy.

MODULE MEDICAL STATISTICS

Prof. MARCO ENEA - Sede IPPOCRATE, - Sede IPPOCRATE

SUGGESTED BIBLIOGRAPHY

Libro di testo

Triola MM Triola MF, Fondamenti di statistica per le discipline biomediche, 2017 Pearson Italia

Altri Libri consigliati

1. Daniel W.W., Biostatistica, Edizione EdiSES

2. Peat,J, Barton B. Medical statistics A Guide to Data Analysis and Critical Appraisal. Blackwell Publishing Ltd 2005

3. Bacchieri A., Della Cioppa G. Fondamenti di ricerca clinica, Springer

AMBIT

50405-Inglese scientifico e abilità linguistiche, informatiche e relazionali, pedagogia medica, tecnologie avanzate e a distanza di informazione e comunicazione

INDIVIDUAL STUDY (Hrs)

45

COURSE ACTIVITY (Hrs)

30

EDUCATIONAL OBJECTIVES OF THE MODULE

The course is aimed to introduce the statistical methodology useful to the comprehension of medical literature. The topics include the understanding of fundamentals of descriptive and inferential statistics. Students will be able to interpret statistical methods and results of scientific articles.

SYLLABUS

Hrs	Frontal teaching
2	Basic concepts: qualitative and quantitative characters, discrete and continuous characters, scales of measurement: nominal, ordinal, intervals and ratio
2	Data presentation: frequency and quantity distributions. Graphical representations
4	Measures of mean and variability
4	Elements of probability theory. Bayes Theorem. Measures of accuracy of diagnostic tests
3	Theoretical distribution for continuous variables: Gauss or Normal distribution. Normal approximation of binomial distribution
3	Central Limit Theorem. Sample distributions of sample mean and sample frequency
4	Estimate of mean and frequency. Confidence Intervals
4	Statistical tests on mean and frequency. The p-value and the statistical power of tests
2	Measuring risk: Odds ratio and Relative Risk, with confidence intervals
2	Statistical tests of association. The Chi-square test

MODULE PHYSICS

Prof. MAURIZIO MARRALE - Sede IPPOCRATE, - Sede IPPOCRATE

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A. Bartolotta: Meccanica dei fluidi. EdiSES. ISBN:978-8879598750
A. Lascialfari, F. Borsa, A.M. Gueli: Principi di Fisica per indirizzo biomedico e farmaceutico. EdiSES. ISBN:978-8836230204
D.C. Giancoli: Fisica (principi e applicazioni). CEA: ISBN: 978-8808880000
R.A. Serway, J.W. Jewett: Guida allo studente e alla risoluzione dei problemi di Principi di Fisica. EdiSES. ISBN: 978-8879592871
D. Scannicchio: Fisica Biomedica. EdiSES. ISBN: 978-8879597814 (da consultare per le applicazioni in Fisica Medica)

AMBIT	50400-Discipline generali per la formazione del medico
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COURSE ACTIVITY (Hrs)	50

EDUCATIONAL OBJECTIVES OF THE MODULE

Ability to present the results of experiments with functions and graphics.
Capacity to continue studies using the basic training received in the course.

SYLLABUS

Hrs	Frontal teaching
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12	Hydrostatic laws. Hydrodynamics of perfect and real fluids. Surface tension
12	Thermodynamics. Temperature and heat transfer. Internal energy and the first law of thermodynamics. Heat engines, second law of thermodynamics, entropy
10	Columb law. Electric field, potential, capacitance of a capacitor, dielectrics, Ohm laws. Magnetic field, Lawrence force.
4	Waves. Electromagnetic spectrum, photons. Radioactivity, applications of ionizing radiation in Diagnostic and therapy.

MODULE MEDICAL STATISTICS

Prof.ssa DOMENICA MATRANGA - Sede CHIRONE, - Sede CHIRONE

SUGGESTED BIBLIOGRAPHY

Libro di testo

Triola MM Triola MF Roy J, Fondamenti di statistica per le discipline biomediche, 2022 Pearson Italia, ISBN 9788891915443

Altri Libri consigliati

1. Daniel W.W. Cross C.L., Biostatistica, III Edizione EdiSES, ISBN 978-88-3319-041-9

2. Bacchieri A., Della Cioppa G. Fondamenti di ricerca clinica, Springer ISBN 88-470-0211-7

AMBIT	50405-Inglese scientifico e abilità linguistiche, informatiche e relazionali, pedagogia medica, tecnologie avanzate e a distanza di informazione e comunicazione
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

The course is aimed to introduce the statistical methodology useful to the comprehension of medical and dental literature. The topics include the understanding of statistical analysis. Students will be introduced to the elementary concepts of descriptive and inferential statistics and will be able to do simple statistical analyses

SYLLABUS

Hrs	Frontal teaching
3	Basic concepts: qualitative and quantitative characters, discrete and continuous characters, scales of measurement: nominal, ordinal, intervals and ratio
3	Data presentation: frequency and quantity distributions. Graphical representations
3	Measures of mean and variability
4	Elements of probability theory. Bayes Theorem. Measures of accuracy of diagnostic tests
4	Theoretical distributions for stochastic variables: Gauss or Normal distribution and Binomial distribution.
1	Measures of occurrence: prevalence and incidence
2	Central Limit Theorem. Sample distributions of sample mean and sample frequency
3	Estimate of mean and frequency. Confidence Intervals
3	Statistical tests on mean and frequency. The p-value and the statistical power of tests
Hrs	Practice
4	Practicals on data analysis

MODULE MEDICAL STATISTICS

Prof.ssa LAURA MANISCALCO - Sede HYPATIA, - Sede HYPATIA

SUGGESTED BIBLIOGRAPHY

Libro di testo

Triola MM Triola MF, Fondamenti di statistica per le discipline biomediche, 2017 Pearson Italia

Altri Libri consigliati

1. Daniel W.W., Biostatistica, Edizione EdiSES

2. Peat,J, Barton B. Medical statistics A Guide to Data Analysis and Critical Appraisal. Blackwell Publishing Ltd 2005

3. Bacchieri A., Della Cioppa G. Fondamenti di ricerca clinica, Springer

AMBIT

50405-Inglese scientifico e abilità linguistiche, informatiche e relazionali, pedagogia medica, tecnologie avanzate e a distanza di informazione e comunicazione

INDIVIDUAL STUDY (Hrs)

45

COURSE ACTIVITY (Hrs)

30

EDUCATIONAL OBJECTIVES OF THE MODULE

The course is aimed to introduce the statistical methodology useful to the comprehension of medical literature. The topics include the understanding of fundamentals of descriptive and inferential statistics. Students will be able to interpret statistical methods and results of scientific articles.

SYLLABUS

Hrs	Frontal teaching
2	Basic concepts: qualitative and quantitative characters, discrete and continuous characters, scales of measurement: nominal, ordinal, intervals and ratio
2	Data presentation: frequency and quantity distributions. Graphical representations
4	Measures of mean and variability
4	Elements of probability theory. Bayes Theorem. Measures of accuracy of diagnostic tests
3	Theoretical distribution for continuous variables: Gauss or Normal distribution. Normal approximation of binomial distribution
3	Central Limit Theorem. Sample distributions of sample mean and sample frequency
4	Estimate of mean and frequency. Confidence Intervals
4	Statistical tests on mean and frequency. The p-value and the statistical power of tests
2	Measuring risk: Odds ratio and Relative Risk, with confidence intervals
2	Statistical tests of association. The Chi-square test