Course title	**Probability theory and mathematical statistics selected parts.**
Volume *(number of credit points)*	2
Volume *(number of contact hours)*	32
Number of lectures	20
Number of seminars, practical and laboratory works	12
Course level: 1-4 – bachelor; 5-6 – master; 7 – doctoral; T – further education	5
Prerequisites	Probability theory. Mathematical statistics.
Science field, science sub-field	Mathematics
Equivalent course	-

COURSE DESIGNER(S)

Name	*Surname*	*Personal ID No*
Viktorija	Carkova	200540-10107

COURSE ABSTRACT

The aim of this course is to acquaint the mathematical specialty students with the grounding concepts, methods, and the most essential results of the contemporary probability theory and mathematical statistics. The statement is based on the axiomatic approach to probability, applying the measure and integral theory for proof of the main probabilistic theorems. The main attention is paid to different concepts on convergence of random sequences including the large number law and the central limit theorem. This course also contains some of mathematical statistics divisions relating to hypotheses testing problem in regression analysis.

RESULTS

On completion of the course the students should be able to operate with with concept of randomness applying axiomatic approach, to prove main probabilistic theorems explain what is meant an axiomatic approach to probability, to define the distribution function of discrete and continuous random vectors, to make use of the conditional expectation technique for correlation analysis, to derive formula for coefficients of regression line, to apply the central limit theorem to asymptotical analysis of random series.

REQUIREMENTS FOR AWARDING CREDIT POINTS

Practical work (30%). Resulting test – exam (70%).

COURSE PLAN

No.	*Topic*	*Planned amount in hours*
1.	**Axioms of probability**	**3**
2.	**Random values**	**3**
3.	**Minimal σ-algebra definaed by random value**	**2**

4.	**Integration of random values**	**2**
5.	**Conditional expectation.**	**4**
6.	**Distribution function. Function of random values. Numerical characteristics of random values.**	**4**
7.	**Two-dimensional normal distribution.**	**3**
8.	**Multy-dimensional normal distribution.**	**3**
9.	**Normal-dependent distributions.**	**-**
10.	**Normal sample.**	**8**

LITERATURE

Basic textbooks

1.	**V.Carkova, M.Buiķis. 25 lekcijas varbūtību reorija. LU, Rīga, 1975.**
2.	**A.Borovkov. ProbabilityTheory. M:Nauka.1986.(kriev.)**
3.	**V.Carkova. Matemātiskā statistika.** R. LU,1979

Further reading

1.	**D.R.Cox and D.V.Hinkley. Teoretical Statistics.** London: Chapman&Hall, 1994
2.	**Sh.M.Ross. Introduction of Probability Models. Fifth Edition, Acad.Press, NY, 1995.**
3.	**A.Francis. Advanced Level Statistics. Stanley Thornes LTD, Great Britain, 1979**

Periodicals, internet resources and other sources

http://www.math.nyu.edu/faculty/varadhan/limittheorems.html
http://www.statsoft.com/products/doe.html#design
http://www.probability.net/WEBnikodym.pdf#absolute:continuity:measure