Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation

APPROVED
Vice-Rector for Academic Affairs
E.S. Bogomolova
31 August 2021

WORKING PROGRAM

Name of the academic discipline: **MATHEMATICS**

Specialty: **33.05.01 PHARMACY**

Qualification: **PHARMACIST**

Department: **MEDICAL BIOPHYSICS**

Mode of study: **FULL-TIME**

Labor intensity of the academic discipline: **72 academic hours**

Nizhny Novgorod
2021

The working program has been developed in accordance with the Federal State Educational Standard for specialty 33.05.01 PHARMACY approved by Order of the Ministry of Science and Higher Education of the Russian Federation No. 219 of March 27, 2018.

Developers of the working program:

D.I. Iydin, Ph.D. (Physical and Mathematical Sciences), Ph.D. (Biology), Professor, Head of the Department of Medical Biophysics of Federal State Budgetary Educational Institution of Higher Education «Privolzhsky Research Medical University» of the Ministry of Health of the Russian Federation

S.L. Malinovskaya, Ph.D. (Biology), Professor of the Department of Medical Biophysics of Federal State Budgetary Educational Institution of Higher Education «Privolzhsky Research Medical University» of the Ministry of Health of the Russian Federation

The program was reviewed and approved at the department meeting of the Department of Medical Biophysics (protocol No. 9, *April 15, 2021*)
Head of the Department of Medical Biophysics,
Ph.D. (Physical and Mathematical Sciences), Ph.D. (Biology),
Professor _____ D.I. Iydin
(signature)

April 15, 2021

AGREED
Deputy Head of EMA ph.d. of biology _____ Lovtsova L.V.
(signature)

April 15, 2021

1. The purpose and objectives of mastering the academic discipline «Mathematics» (hereinafter – the discipline):

1.1. **The purpose of mastering the discipline:** participation in the formation of the competencies of UC-1, GPC -1, consisting in the formation of students' ability to carry out a critical analysis of problem situations based on a systematic approach, develop a strategy of actions and the ability to use basic biological, physico-chemical, mathematical methods for the development, research and examination of medicines.

1.2. **Tasks of the discipline:**

- formation of students' logical thinking, the ability to accurately formulate a task, the ability to isolate the main and secondary, the ability to draw conclusions based on the obtained measurement results;
- teaching students the methods of mathematical statistics, which are used in pharmacy and allow extracting the necessary information from the results of observations and measurements, to assess the degree of reliability of the data obtained.

1.3. **Requirements to the deliverables of mastering the discipline**

As a result of completing the discipline, the student should

Know:

- fundamentals of probability theory and mathematical statistics;
- mathematical and statistical analysis of quantitative and qualitative data;
- the methodology of mathematical processing of the results of the physical characteristics of a biological object.

Be able to:

- use the principles of mathematical analysis of the elements of the received information;
- solve differential equations necessary for the compilation and prediction of mathematical models;
- to evaluate the errors of a series of repeated measurements of a physical quantity;
- to carry out statistical processing of experimental data using null and alternative hypotheses, parametric and nonparametric criteria, correlation, regression and variance analyses;
- calculate the main characteristics of time series and predict the behavior of the system.

Possess:

- the method of solving differential equations necessary for the compilation and prediction of mathematical models;
- the methodology of time series analysis;
- the main methods of statistical processing of experimental results of chemical and biological studies.

2. Position of the academic discipline in the structure of the General Educational Program of Higher Education (GEP HE) of the organization.

2.1. The discipline «Mathematics» refers to the core part of Block 1 (B1.E.8) of GEP HE. The discipline is taught in 1 semester/1year of study.

2.2. The following knowledge, skills and abilities formed by previous academic disciplines are required for mastering the discipline:

- school physics course,

- school math course.

2.3. Mastering the discipline is required for forming the following knowledge, skills and abilities for subsequent academic disciplines: physiology, biochemistry, microbiology and virology, hygiene, public health, radiation diagnostics and radiation therapy.

3. Deliverables of mastering the academic discipline and metrics of competence acquisition

Mastering the discipline aims at acquiring the following universal (UC) or/and general professional (GPC) or/and professional (PC) competencies

№	Compe-tence code	The content of the competence (or its part)	Code and name of the competence acquisition metric	As a result of mastering the discipline, the students should:		
				know	be able to	possess
1.	UC-1	Able to carry out a critical analysis of problem situations based on a systematic approach, develop an action strategy	*ID-1* *CC-1.1.* Knows: methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis *ID-2* *CC-1.2.* Able to: gain new knowledge based on analysis, synthesis, etc.; collect data on complex scientific problems related to the professional field; search for information and solutions based on action, experiment and experience	methods of systematic and critical analysis; methods of developing action strategies for identifying and solving a problem situation	apply the methods of a systematic approach and critical analysis of problem situations; develop a strategy of actions, make concrete decisions for its implementa-tion	methodology of systematic and critical analysis of problem situations; methodology of goal setting, determinatio n of ways to achieve it, development of action strategies.
2.	GPC -1	Able to use basic biological, physico-chemical, mathematical methods for the development, research and examination of medicines.	*ID-1* *OPK-1.4.* Knows: mathematical and statistical analyses Able to: apply mathematical processing of data obtained in the development of medicines, as well as in the study and examination of medicines and medicinal plant raw materials.	mathematical and statistical analyses of quantitative and qualitative data characteri-zing the physical, bio-physical, chemical and biochemical state of the drug and the patient's con-dition after the introduc-tion of the drug into the patient's body; the me-thodology of	to use the principles of mathematical analysis of the elements of the obtained information, to solve the differential equations necessary for the creation and forecasting of mathematical models; to estimate the errors of a series of repeated mea-surements of physical	abstract thinking methodology for making conclusions about the results of me-asurements of the phy-sical charac-teristics of biological objects and mathematical processing of the data obtained; the method of solving differential equations, necessary for the

				mathematical processing of the results of the physical characteris-tics of a biological object.	reality; to implement statistical information. the work of experimental data, using null and alternative hypotheses, parametric and non-parametric criteria, correlation regression and variance analyses, calculate the basic charac-teristics of time series and predict the behavior of the system.	compilation and forecasting of mathematical models; the main statistical methods for evaluating measurement results.

** Competence achievement indicator – a set of planned learning outcomes in disciplines (modules) and practices that ensure the formation of all graduate competencies established by the specialty program.*
These are generalized characteristics that clarify and reveal the formulation of competence in the form of specific actions performed by a graduate who has mastered this competence. Indicators should be comparable to labor functions and/or labor actions (professional standard), but not equal to them. Indicators of competence achievement should be measured using the means available in the educational process.

4. Sections of the academic discipline and competencies that are formed when mastering them:

№	Competence code	Section name of the discipline	The content of the section in teaching units
1.	UC-1, GPC -1	Fundamentals of mathematical analysis. The simplest differential equations.	The concept of the limit of a function. The derivative of a function of one variable. Standard derivatives. Rules for taking derivatives. Geometric and mechanical meaning of the first derivative. Application of derivatives to the study of functions. Higher order derivatives. The derivative of a complex function. The differential of the function. Analytical and geometric meaning of the differential. Derivatives of a function of two or more variables. Partial derivatives, partial and full differentials of a function of several variables. Indefinite integral. Table of standard integrals. Rules for taking indefinite integrals. Basic properties of an indefinite integral. Direct integration method, substitution method. The concept of a definite integral, its geometric meaning. The Newton-Leibniz Rule. Application of a certain integral to solve applied problems. Ordinary differential equations. The order of the equation. General and partial solutions of the differential equation. First-order differential equations with separable variables. Principles of construction of mathematical models in problems of physico-chemical and biomedical content based on the simplest differential equations.
2.	UC-1,	Fundamentals of probability	Random events and random variables, their classification. Expected events. Frequencies and relative frequencies of expected events.

	GPC -1	theory and descriptive statistics.	Probability. Classical and statistical definitions of probability. The addition theorem for incompatible events. Multiplication theorem for independent events. Conditional probability. Full probability. The Bayes formula. Discrete and continuous random variables. The numerical characteristics of a discrete random variable, their properties. Probability distribution functions for the occurrence of a discrete random variable. Numerical characteristics of a continuous random variable. Fundamental statistical distributions of medical data (Bernoulli, Poisson, Normal). Criteria of Normal distribution. Evaluation of the required number of repeated trials for a reliable study. The probability of a normally distributed random variable falling into a given interval. Confidence interval and confidence probability. Standard intervals (1-σ, 2-σ, 3-σ intervals).
3.	UC-1, GPC -1	Statistical methods of research and data processing.	General and sample populations. Representativeness of the sample. Statistical distribution of the sample, discrete and interval variation series. Point estimates of distribution parameters. Descriptive statistics. The characteristics of the position are: the mean, the median, the mode, the largest and smallest element of the sample. Scattering characteristics: range of variation, mean absolute deviation, sample variance, corrected variance, standard (standard deviation), coefficient of variation. Absolute and relative errors. Errors of direct and indirect measurements. Methods of statistical processing of variation series. Statistical hypotheses. Null and competing hypotheses. Statistical criteria. Comparison of the average values of two normally distributed general populations, whose variances are unknown and the same according to the results of small independent samples. Testing the hypothesis of equality of variances of two normally distributed general aggregates according to their estimates. Correlation relationship of paired variational series. Regression lines. Linear regression equations, regression coefficients. The linear correlation coefficient, its properties. Calculation of the sample coefficient of linear correlation. Calculation of parameters of linear approximation of experimental dependences between quantities by the method of least squares. Factorial and residual variance. Comparison of several averages by single-factor analysis of variance. The concept of two-factor and multifactorial analysis of variance. Discrete and continuous time series, their characteristics. The trend equation. Smoothing of time series: the moving average method.
4.	UC-1, GPC -1	Mathematical optimization methods.	Optimization tasks in pharmacy (optimization of production plans, transportation, etc.). The concept of linear programming. The concept of the objective function. Basic and acceptable solutions. A graphical method for solving a linear programming problem. The transport problem of linear programming. The basic concepts of the theory of queuing systems: the density of the flow of requirements, the intensity of service, the discipline of service. Single-channel and multi-channel queuing systems. The main characteristics of a single-channel queuing system.

5. Volume of the academic discipline and types of academic work

Type of educational work	Labor intensity		Labor intensity (AH) in semesters
	volume in credit units (CU)	volume in academic hours (AH)	1
Classroom work, including	**1, 2**	**44**	**44**
Lectures (L)	0,28	10	10
Laboratory practicum (LP)	0,94	34	34
Practicals (P)	***FSES are not provided***		
Seminars (S)	***FSES are not provided***		
Student's individual work (SIW)	**0,78**	**28**	**28**
Mid-term assessment			
CREDIT			
TOTAL LABOR INTENSITY	**2**	**72**	**72**

6. Content of the academic discipline

6.1. Sections of the discipline and types of academic work

№	Semester No.	Name of the section of the academic discipline	Types of academic work* (in AH)					
			L	LP	P	S	SIW	total
1.	1.	Fundamentals of mathematical analysis. The simplest differential equations.		8			6	14
2.	1.	Fundamentals of probability theory and descriptive statistics.	4	11			6	21
3.	1.	Statistical methods of research and data processing.	6	1			8	29
4.	1.	Mathematical optimization methods.					8	8
		CREDIT						
		TOTAL	***10***	***34***			***28***	***72***

** - L – lectures; LP – laboratory practicum; P – practicals; S – seminars; SIW – student's individual work.*

6.2. Thematic schedule of educational work types:

6.2.1. Thematic schedule of lectures

№	Name of lecture topics	Volume in AH
		Semester 1
1.	Random events and random variables, their classification. Classical and statistical definitions of probability.	1
2.	Conditional probability. Full probability. The Bayes formula.	0,5
3.	Fundamental statistical distributions.	1
4.	Criteria of normal distribution. Evaluation of the required number of repeated trials for a reliable study.	0,5
5.	Confidence interval and confidence probability. The probability of a normally distributed random variable falling into a given interval.	1
6.	General and sample populations. Representativeness of the sample. Statistical distribution of the sample, discrete and interval variation series.	1,5
7.	The task of statistical hypotheses.	3
8.	Statistical, correlation and functional dependencies. Regression lines. Linear regression equations, regression coefficients.	1,5

	TOTAL (total - AH)	***10***

6.2.2. The thematic plan of laboratory practicums

№	***Name of laboratory practicums***	Volume in AH
		Semester 1
1	Higher-order derivatives. Application of derivatives to the study of functions.	1
2	The derivative of a complex function.	1
3	Partial derivatives; partial differentials, the complete differential of a function of several variables.	1
4	Integration by substitution method.	2
5	Definite integrals. Application of certain integrals to solve applied problems.	2
6	First-order differential equations with separable variables.	1
7	Conditional probabilities. Theorems of probability (addition, multiplication of probabilities, Bayes).	3
8	Distributions of random events and random variables. Calculation of numerical characteristics of the general population.	3
9	Solving problems on fundamental statistical distributions.	3
10	Confidence intervals, confidence probabilities of normally distributed random variables; standard intervals.	2
11	Statistical distribution of the sample, discrete and interval variation series. Graphic characteristics. Descriptive statistics.	3
12	Errors of direct and indirect measurements. Methods of statistical processing of variation series.	4
13	Testing the hypothesis of equality of variances of two normally distributed general aggregates according to their estimates.	2
14	Calculation of the sample coefficient of linear correlation. Regression lines. Linear regression equations.	2
15	Application of the least square method to the solving linear equations.	2
16	Single-factor analysis of variance.	2
	TOTAL (total - AH)	***34***

6.2.3. Thematic plan of practicals

- FSES are not provided.

6.2.4. Thematic plan of seminars

- FSES are not provided.

6.2.5. Types and topics of student's individual work (SIW)

№	***Types and topics of SIW***	Volume in AH
		semester 1
1	Fundamentals of mathematical analysis. The simplest differential equations. *Independent work with educational literature to prepare for practical and credit classes.HW, DEW*	6
2	Fundamentals of probability theory and descriptive statistics. *Work with literature sources; preparation for classes in an interactive form; preparation for boundary control, including work with electronic educational resources (computer testing in on-line mode on the website of distance education of PIMU). HW, DEW*	6
3	Statistical methods of research and data processing. *Work with literary sources of information, including work with electronic educational resources (computer testing in on-line mode on the website of distance education of PIMU). HW, DEW*	8
4	Mathematical optimization methods. *Work with literature sources; preparation for classes in an interactive form; preparation for boundary control, including work with electronic educational resources (computer testing in on-line mode on the website of distance education of PIMU). HW, DEW*	8
	TOTAL (total – AH)	***28***

***Types of independent work: work with literary and other sources of information on the section under study, including in an interactive form, homework (HW), work with electronic educational resources posted on the educational portal of the University,*

distance education website (DEW), etc.

7. Types of assessment formats for ongoing monitoring and mid-term assessment

№	Semester No.	Types of control		Name of section of academic discipline	Competence codes	Assessment formats		
						types	number of test questions	number of test task options
1.	1	Current monitoring	Control of mastering the topic	Fundamentals of mathematical analysis. The simplest differential equations.	UC-1 GPC -1	Test	30	20 - Computer testing (the variant is formed by random sampling)
						Testing of practical skills.	3	20
						Interview	2	50
			Monitoring the student's individual work			Writing a test paper (or preparing an audio report)	8	45
2.	1	Current monitoring	Control of mastering the topic	Fundamentals of probability theory and mathematical statistics.	UC-1 GPC -1	Test tasks. Oral individual survey.	30	20 - Computer testing (the variant is formed by random sampling)
						Current testing. Control work.	6	12
						Current testing. Oral individual survey.	20	50
			Monitoring the student's individual work			Writing a report on an individual task (or preparing an audio report).	20	12
3.	1	Current monitoring	Control of mastering the topic	Statistical methods of research and data processing.	UC-1 GPC -1	Test tasks. Oral individual survey.	30	20 - Computer testing (the variant is formed by random sampling)
						Current testing. Control work.	6	12
						Current testing. Oral individual survey.	20	30
			Monitoring the student's individual work			Writing a report on an individual task (or preparing an audio report).	20	12
4.	1	Current monitoring	Control of mastering the topic	Mathematical optimization methods.	UC-1 GPC -1	Test tasks. Oral individual survey.	20	20 - Computer testing (the variant is formed by random sampling)
						Current testing. Control work.	6	12
						Current testing. Oral individual survey.	20	30
			Monitoring the student's individual work			Writing a report on an individual task (or preparing an audio report).	20	12
5.	1	Mid-term assessment	**CREDIT**	All sections	UC-1 GPC -1	Test tasks.	200	Computer testing (the variant is formed by random sampling)
						Oral individual survey.	4	12

8. Educational, methodological and informational support for mastering the academic discipline (printed, electronic publications, the Internet and other network resources)

8.1. Key literature references

№	Name according to bibliographic requirements	Number of copies	
		at the department	in the library
1.	Martin Bland. An Introduction to Medical Statistics. Published in the United States by Oxford University Press Inc., New York, 2015.- 448 p.		
2.	R.H. Riffenburgh. Statistics in medicine. Academic Press a division of Harcourt Brace&Company, San Diego, California. 1999.- 581 p.		

8.2. Further reading

№	Name according to bibliographic requirements	Number of copies	
		at the department	in the library
1.	Malinovskaya S.L., Iydin D.I., Drygova O.V., Myravyova M.S., Syssoev A.A. Math problem book. – Nizhny Novgorod: Publishing House of Privolzhsky Research Medical University, 2023.- 118 p.		
2.	Monich V.A. Practical course of mathematics, probability theory and statistics. – Nizhny Novgorod: Publishing House of Privolzhsky Research Medical University, 2018.- 72 p.		

8.3. Electronic educational resources for teaching academic subjects

8.3.1. Internal Electronic Library System of the University (IELSU)

№	*Name of the electronic resource*	*Brief description (content)*	*Access conditions*	*Number of users*
	Internal Electronic Library System (EBS)	The works of the academic staff of the Academy: textbooks and manuals, monographs, collections of scientific papers, scientific articles, dissertations, abstracts of dissertations, patents.	from any computer located on the Internet, using an individual login and password [Electronic resource] – Access mode: http://95.79.46.206/login.php	Not limited

8.3.2. Electronic educational resources acquired by the University

№	*Name of the electronic resource*	*Brief description (content)*	*Access conditions*	*Number of users*
	Electronic database "Student Consultant"	Educational literature + additional materials (audio, video, interactive materials, test tasks) for higher medical and pharmaceutical education. Publications are structured by specialties and disciplines in accordance with the current Federal State Educational Standards of Higher Education.	from any computer located on the Internet, using an individual login and password [Electronic resource] – Access mode: http://www.studmedlib.ru /	General PIM subscription
	Electronic library system "Bukap"	Educational and scientific medical literature of Russian publishers, including translations of foreign publications.	from any computer located on the Internet by login and password, from the computers of the academy. The publications for which a subscription is issued are available for reading. [Electronic resource] – Access mode: http://www.books-up.ru/	General PIM subscription

	"Bibliopoisk"	Integrated "single window" search service for electronic catalogs, EBS and full-text databases. The results of a single search in the demo version include documents from domestic and foreign electronic libraries and databases available to the university as part of a subscription, as well as from open access databases.	PIM has access to the demo version of the Bibliopoisk search engine: http://bibliosearch.ru/pimu.	General PIM subscription
	Domestic electronic periodicals	Periodicals on medical subjects and on higher school issues	- from the academy's computers on the electronic library platform eLIBRARY.RU -magazines Media Sphere Publishing house - from library computers or provided by by the library at the request of the user [Electronic resource] – Access mode: https://elibrary.ru/	General PIM subscription
	International scientometric database "Web of Science Core Collection"	Web of Science covers materials on natural, technical, social, and humanitarian sciences; takes into account the mutual citation of publications developed and provided by Thomson Reuters; has built-in capabilities for searching, analyzing, and managing bibliographic information.	Access is free from PIM computers [Electronic resource] – Access to the resource at: http://apps.webofknowledge.com	Access is free from PIM computers

8.3.3 Open access resources

Name of the electronic resource	*Brief description (content)*	*Access conditions*
Federal Electronic Medical Library (FEMB)	It includes electronic analogues of printed publications and original electronic publications that have no analogues recorded on other media (dissertations, abstracts, books, magazines, etc.). [Electronic resource] – Access mode: http://nel.ru/	from any computer located on the Internet
Scientific Electronic Library eLIBRARY.RU	The largest Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of scientific articles and publications. [Electronic resource] – Access mode: https://elibrary.ru /	from any computer located on the Internet.
Open Access Scientific Electronic Library CyberLeninka	Full texts of scientific articles with annotations published in scientific journals of Russia and neighboring countries. [Electronic resource] – Access mode: https://cyberleninka.ru /	from any computer located on the Internet
Russian State Library (RSL)	Abstracts for which there are copyright agreements with permission for their open publication [Electronic resource] – Access mode: http://www.rsl.ru /	from any computer located on the Internet
Legal reference system "Consultant Plus"	Federal and regional legislation, judicial practice, financial advice, comments on legislation, etc. [Electronic resource] – Access mode: http://www.consultant.ru/	from any computer located on the Internet
Official website of the Ministry of Health of the Russian Federation	National clinical guidelines. [Electronic resource] – Access mode: cr.rosminzdrav.ru - Clinical recommendations	from any computer located on the Internet
Official website of the Russian Respiratory Society	Modern materials and clinical recommendations for the diagnosis and treatment of respiratory diseases [Electronic resource] – Access mode: www.spulmo.ru – Russian Respiratory Society	from any computer located on the Internet
Official website of the Russian Scientific Society of Therapists	Modern materials and clinical recommendations for the diagnosis and treatment of diseases of internal organs [Electronic resource] – Access mode: www.rnmot.ru – Russian Scientific Society of Therapists	from any computer located on the Internet

9. Material and technical support for mastering an academic discipline

9.1. List of premises for classroom activities for the discipline

9.1.1. *For lectures there are:*
- BFC lecture halls (large and small halls);
- lecture hall of the Morphological Building;
- lecture hall of dormitory No. 3;
- lecture hall of building No. 9.

9.1.2. *For practical training on the basis of building No. 2 there is:*
- 4 specially equipped rooms (classrooms) for seminars and practical classes in the study of disciplines;
- 4 display classes.

9.2. List of equipment for classroom activities for the discipline:

9.2.1. *Classrooms equipped with:*
- educational boards, educational furniture, teaching materials, PC, overhead projector, multimedia projector, laptop, Internet access.

9.2.2. *A set of experimental equipment:*
- Personal computers TCN.
- BENQ monitors.
- Laser printer.
- Laptops.
- Video lectures.
- Videos for laboratory work.
- Presentations of lectures.

** multimedia complex (laptop, projector, screen), TV, video camera, slide show, video recorder, PC, video and DVD players, monitors, sets of slides, tables/multimedia visual materials on various sections of the discipline, videos, whiteboards, etc.*

9.3. Set of licensed and freely distributed software, including domestic production

№	*Software*	*Number of licenses*	*Type of software*	*Manufacturer*	*Number in the unified register of Russian software*	*№ and contract date*
1.	Wtware	100	Thin Client Operating System	Kovalev Andrey Alexandrovich	1960	2471/05-18 of 28.05.2018
2.	My Office Is Standard. A corporate user license for educational organizations, with no expiration date, with the right to receive updates for 1 year.	220	Office Application	LLC " NEW CLOUD TECHNO-LOGIES "	283	without limitation, with the right to receive updates for 1 year.
3.	LibreOffice		Office Application	The Document Foundation	Freely distributed software	
4.	Windows 10 Education	700	Operating systems	Microsoft	Subscrip-tion Azure Dev Tools for Teaching	
5.	Yandex.Browser		Browser	LLC «YANDEX»	3722	
6.	Subscription to MS Office Pro for 170 PCs for the FSBEI HE PRMU MOH Russia	170	Office Application	Microsoft		23618/HH10030 LLC "Softline Trade " of 04.12.2020

10. List of changes to the working program (to be filled out by the template)

Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation
(FSBEI HE "PRMU" of the Ministry of Health of Russia)

Department of
MEDICAL BIOPHYSICS

CHANGE REGISTRATION SHEET

working program for the academic discipline
MATHEMATICS

Field of study / specialty / scientific specialty: _____
(code, name)

Training profile: _____
(*name) - for master's degree programs*

Mode of study: _____
full-time/mixed attendance mode/extramural

Position	Number and name of the program section	Contents of the changes made	Effective date of the changes	Contributor's signature
1				

Approved at the department meeting
Protocol No. _____of _____20__

Head of the Department
_____ _____/_____
department name, academic title signature print name