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| **Зображення, що містить текст, Шрифт, знімок екрана, ряд  Автоматично згенерований опис** | **National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”** |  | **Department of Organic Chemistry and Technology of Organic Substances** |

**Scientific Writing: From Grant Proposal to Report**

**Working program of the academic discipline (Syllabus)**

# Details of the academic discipline

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| Level of higher education | *Second (master's) degree* |
| Field of knowledge | *16 Chemical and bioengineering* |
| Specialty | *161 Chemical Technology and Engineering* |
| Educational scientific program | *Chemical technology and engineering* |
| The status of the educational component | *Selective* |
| Form of education | *Full-time (day)* |
| Year of training, semester | *1nd year, spring semester* |
| The scope of the educational component | *4 ECTS credits / 120 hours (lectures – 18 hours, practical classes – 36 hours,* *self-education – 66 hours)* |
| Semester control / control measures | *Test / Module test / Homework test* |
| Class schedule | *Lecture 2 hours per two weeks (1 class per two weeks), practical work 2 hours per week (2 classes per two weeks) according to the schedule on schedule.kpi.ua* |
| Language | *English* |
| Information about the course leader / teachers | *Lecture:**Professor Andrey Fokin,* *aaf@xtf.kpi.ua* |
| Placement of the course | *Google Classroom (Google G Suite for Education, domainLLL.kpi.ua, Sikorsky-distance platform).* *Educational component ”Scientific writing: from funding application to report”* *https://campus.kpi.ua/tutor/index.php?mode=mob&sd=10204&cm=79480&rcms**=260228&ssm=cm&tree\_list=* |

# Program of Educational disciplone

# Description of the educational component, its purpose, subject of study and learning outcomes

*The teaching of the educational component ‘Modern materials in membrane technologies’ to Master's degree students is due to the need to provide students with knowledge covering the field of chemical materials science and nanotechnology, in particular, the creation of polymeric and ceramic membranes for micro-, ultra-, nanofiltration membranes for a wide range of applications.*

*The study of the educational component enhances the following programme* ***learning outcomes****:*

1. *Ability to present scientific results in English in the form of a scientific discussion (CP 1);*
2. *Ability to write scientific articles/projects/reports in English (CP 3);*
3. *Ability to analyse and select the latest and most relevant literature for the purpose of critical analysis of modern research in the field of chemical materials science (CP 4).*

*The study of the educational component enhances the following* ***programme learning outcomes****:*

1. *Fluency in reading technical literature in English (CPO 1);*
2. *Prepare scientific articles/projects/reports in English (CPO 3);*
3. *Analyse and select the latest and most relevant literature for critical analysis of current research in the field of chemical materials science (CPO 4);*
4. *Present scientific results in English in the form of a scientific discussion (CPO 7);*

# Pre-requisites and post-requisites of the educational component (place in the structural and logical scheme of training according to the relevant educational program)

***Pre-qualifications:*** *Knowledge of English (at least B2 level), Bachelor's degree in Chemical Technology and Engineering, speciality 161.*

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| ***Post-qualifications:*** |
| ***Еxperimental methods in research*** | *The ability to operate with a high degree of confidence with modern methods of experimental research of the physicochemical properties of chemical compounds and the ability to apply this knowledge in practical research work and technological developments.* |
| ***Scientific and Research practice*** | *The ability to conduct a high-quality search in scientific and technical literature, patents, databases and other sources in order to find the necessary information about chemical technology, purification processes and equipment, the production of chemicals and materials based on them, systematize and evaluate relevant information* |
| ***Performing master thesis*** | *Ability to apply modern solutions in the field of chemical research and technology development. Ability to analyze, describe, present and defend the results of one's own research in accordance with internationally recognized Good Research Practice.* |

*This educational component is the basis for further study for a PhD in various applied studies associated with preparation and properties of large molecules.*

# Content of the educational component

**Topic 1**. The concept of scientific research, content and components of the scientific research process.

**Topic 2**. Informational provision of scientific work. Documentary literature. Periodicals. Leading scientific editors.

**Topic 3**. Information support of scientific work. Scientific databases.

**Topic 4**. The process of reviewing scientific publications.

**Topic 5**. Content and components of the research process. Writing an application for financing a scientific work.

**Topic 6**. Content and components of the research process. Writing a review.

**Topic 7**. Content and components of the research process. Preparation of a scientific manuscript.

**Topic 8**. Content and components of the research process. Preparation of a review of a scientific paper.

# Educational materials and resources

*The teaching materials listed below are available at the University Library and at the library of the Department of Organic Chemistry. The basic literature is mandatory, while other materials are optional. The modules and topics that the student should read independently are indicated by the lecturer during lectures and practical classes.*

***Basic***

1. *Ethical Guidelines to Publication of Chemical Research., http://pubs.acs.org/userimages/ContentEditor/1218054468605/ethics.pdf.*
2. *Scientific Writing. Jennifer Peat, Elizabeth Elliott, Louise Baur, Victoria Keena. BMJ books, 351 p.https://books.google.de/books?hl=ru&lr=&id=sTu0DAAAQBAJ&oi=fnd&pg=PP2&dq=scientific+writing&ots=sLChKLR8eA&sig=LdtFgotI5ik1MujEEOkpVR73HXk#v=onepage&q=scientific%20writing&f=false. Adopted by Andrey A. Fokin and Tatyana S. Zhuk.*

*as “Scientific Writing: From Grant Proposal to the Report. – 153 p.”*

1. *Стеченко Д. М. Методологія наукових досліджень. Київ:Знання, 2007. – 317 с.*
2. *Бідасюк Н. Заголовок наукової статті англійською мовою без помилок. Вища школа. - 2019. - № 12. ISSN 1682-2366*

***Optional***

1. *Thinking with Type: A Critical Guide for Designers, Writers, Editors, and Students (3rd Edition, Revised and Expanded). Ellen Lupton Chronicle Books, 2024, 256 p. https://books.google.de/books?hl=ru&lr=&id=AnrsEAAAQBAJ&oi=fnd&pg=PA6&dq=shounder+thinking+through+clear+writing&ots=GIiKV3Fh-l&sig=RsL8XA19tHy7gTuTrE7gQWmLM5A#v=onepage&q&f=false.*
2. *Writing With Power: Techniques for Mastering the Writing Process. Peter Elbow, Oxford University, 1998 г. 416 p.* [*https://books.google.de/books?hl=ru&lr=&id=6tDQCwAAQBAJ&oi=fnd&pg=PR10&dq=shounder+thinking+through+clear+writing&ots=qxtzjfgd6A&sig=OHim4GMxmdAoXOCq1CAuieDvh1U#v=onepage&q=shounder%20thinking%20through%20clear%20writing&f=false*](https://books.google.de/books?hl=ru&lr=&id=6tDQCwAAQBAJ&oi=fnd&pg=PR10&dq=shounder+thinking+through+clear+writing&ots=qxtzjfgd6A&sig=OHim4GMxmdAoXOCq1CAuieDvh1U#v=onepage&q=shounder%20thinking%20through%20clear%20writing&f=false)
3. *Sections of classic monographs, modern specialized monographs, reviews from peer-reviewed journals (Chem. Rev., Acc. Chem. Res., Chem. Soc. Rev., etc.), original journal articles (in English) are provided.*

# Educational content

# Methods of learning the educational component

***Lectures***

*Reading of lectures on the discipline is conducted in parallel with students' completion of individual tasks and their consideration of issues submitted for independent work. When giving lectures in mixed learning, video conferencing tools (Google Meet, Zoom, etc.) and illustrative material in the form of presentations are used to communicate to listeners via chat. After each lecture, it is recommended to familiarize yourself with the materials recommended for independent study, and before the next lecture, repeat the material of the previous one. Each student receives an individual task in the form of an original article on the topic of the lecture.*

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| ***№*** | ***Description of the lecture*** |
| *1* | *Content and components of the research process.**Main points: General aspects, modern trends, Positions of Ukraine in world scientific publishing* |
| *2* | *Scientific literature**Main points: Periodicals. Leading scientific editors. Monographs. Leading scientific editors.*  |
| *3* | *Scientific databases* *Main points: General aspects, WebofScience, Scopus, Google Scholar, Positions of Ukraine and KPI.* |
| *4* | *The process of reviewing scientific publications, general aspects**Main points: Peer-review process, impact factors, referee report*  |
| *5* | *Preparation of a review of a scientific work**Main points: Preparation of a review of a scientific work, modern trends, open access, predator journals. .* |
| *6* | *Writing an application for financing a scientific work**Main points: Funding agencies, calls for proposals, application process.* |
| *7* | *Preparation of a scientific manuscript.**Main points: Types of contribution, structure of manuscript, cover letter* |
| *8* | *Presentation of scientific results. Scientific report.**Main points: Preparation of a scientific report, conference presentation.* |
| *9* | *Final session. Summary of results* |

***Practical works***

*Practical work aims to teach students to independently evaluate the role of reaction intermediates in specific chemical transformations through problem solving.*

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| ***Lessons*** | ***Topic*** | ***Description*** |
| *1-6* | *Topic 1. Work on the application for financing (in English).* | *Each student prepares his own research proposal (RP) based on the topic of his research work. During lessons the key points of RP are discussed not only from scientific point of view, but rather through correcting and improving his(her) writing style.*  |
| *7-12* | *Topic 2 Reviewing the manuscript of a scientific article (in English).* | *Each student receives 2 manuscripts (or retracted papers) and provided the referee report form, which should be filled accordantly to the scientific and ethical standards. En route some key aspects of peer review process are discussed, in particular the scientific misconduct, plagiarism and fake review.*  |
| *13-18* | *Topic 3 Work on a scientific report (in English)* | *In this part of practice each student present his own research results obtained during his work on diploma project. Special attention is paid to the abstract, graphical abstract, result and discussion and conclusion sections. Students also gain experience with use of automatic reference programs such as Endnote to improve the quality of the reference section.**Results summarisation. Students are informed of the number of points they have gained during the semester.* |

# Self-studying

*Self-studying during the semester includes repetition of lecture material, preparation for control measures on lecture material, preparation for written work, preparation for homework and module tests, reports, as well as preparation for final test.*

*The student's independent work (SIW) during the semester includes repeating the lecture material, mastering the theoretical material assigned for independent self-study, completing individual tasks, and preparing for the test. The recommended number of hours allocated to preparation for the specified types of work.*

*Preparation for classroom classes: repetition of lecture material, compilation of preliminary versions of programs for conducting calculations in classes, preparation of reports 1-3 hours per week.*

*The recommended number of hours allocated for preparation for these types of work:*

|  |  |
| --- | --- |
| ***Type of Self-studying*** | ***Number of hours to prepare*** |
| *Preparation of class tasks, repeating the lecturing material, working on individual tasks* | *30 h* |
| *Finalization of research statement* | *20 h* |
| *Preparation of referee report*  | *10 h* |
| *Preparation to the final* | *6 h* |
| ***Total*** | *66 h* |

# Policy and control

# The policy of the educational component

*All requirements do not contradict the legislation of Ukraine and correspond to the regulatory documents of the University. In the normal mode of work of the university, lectures and practical classes are held in classrooms. In the mixed mode, lecture classes are conducted through the distance learning platform. At the beginning of each lecture, the lecturer can conduct a survey based on the materials of the previous lecture using interactive tools (Google Forms). Before the start of the next topic, the lecturer can send questions using interactive tools in order to determine the level of knowledge of the applicants on the given topic, increase interest and involve the listeners in solving the examples. After checking the assignment by the teacher for defense, a general grade is given and the work is considered defended.*

*Untimely protection and performance of work without a valid reason are penalized in accordance with the rules for assigning incentive and penalty points.*

*Rules for assigning incentive and penalty points:*

*Late completion of a practical task without a valid reason is penalized by 1 point;*

*The policy of deadlines and rescheduling: determined by clause 8 of the Regulation on current, calendar and semester control of study results at KPI named after Igor Sikorsky*

*Academic Integrity Policy: Determined by the Academic Integrity Policy and other provisions of the University's Honor Code.*

# Types of control and rating system for evaluating learning outcomes

*Types of control are established in accordance with the Regulations on current, calendar and semester control of learning outcomes at Igor Sikorsky Kyiv Polytechnic Institute:*

*1. Current control: questioning during lectures, practical work, module test, etc.*

*2. Calendar control: carried out twice a semester as a monitoring of the current state of fulfilment of the Syllabus requirements.*

*3. Semester control: oral test.*

***A rating system for evaluating learning outcomes***

*The student's credit module rating is calculated based on a 100-point scale, of which 70 points are the starting scale. The starting rating (during the semester) consists of points that the student receives for:*

*- Completion of individual tasks (2 lesson topics);*

*– writing a grant application (ICW);*

**Practical work:**

***Writing a grant application (module test)***

*The goal is the practical assimilation and consolidation of theoretical knowledge obtained at lectures and in the process of independent work with literary sources during the study of the academic discipline.*

*The number of tasks of this type is 1.*

*The modular control work is estimated at 40 points.*

*Evaluation criteria:*

*The weighting score is 30 points*

*“excellent”, complete answer (95-100% of the required information) – 38-40 points;*

*“good”, a sufficiently complete answer (75-94% of the required information or minor inaccuracies) - 30÷37 points;*

*“satisfactory”, incomplete answer (60-74% of the required information and some errors) – 24÷29 points;*

*“unsatisfactory”, unsatisfactory answer (less than 60%) – 0 points.*

***Writing a review***

*The goal is the practical assimilation and consolidation of theoretical knowledge obtained at lectures and in the process of independent work with literary sources during the study of the academic discipline. The modular control work is estimated at 30 points.*

**Evaluation criteria:**

*The weighting score is 30 points*

*“excellent”, creative disclosure of the issue, fluency in the material (95-100%) – 28.5-30 points;*

*“good”, in-depth disclosure of the issue (75-94%) – 22.5-28 points;*

*“satisfactory”, incomplete coverage of the topic (60-74%) – 18-22 point;*

*“unsatisfactory” (less than 60%) – 0 points.*

**Test**

This control work is estimated at 30 points.

The theoretical question evaluation system:

*“excellent”, creative disclosure of the issue, fluency in the material (95-100%) – 28.5-30 points;*

*“good”, in-depth disclosure of the issue (75-94%) – 22.5-28 points;*

*“satisfactory”, incomplete coverage of the topic (60-74%) – 18-22 point;*

*“unsatisfactory” (less than 60%) – 0 points.*

# The maximum number of points that a student can earn during the semester is 70 points: RS = 30 + 40 = 70 points

# The condition for admission to the credit is the completion of individual tasks and the number of rating points of at least 40.

# 7. Penalty and incentive points

*Bonus points are added:*

*Up to 1 incentive point is awarded for active work at lectures (but no more than 5 points per semester).*

*for the quality of individual tasks - 3 points.*

*Students who have scored 42 or more semester points (0.6 rating for work during the semester) can take the exam. If the semester rating is less than 42 points, additional processing of the material is required in order to increase the rating (fulfillment of the required number of individual tasks).*

*Students receive positive attestations in the semester if the current sum of scored points corresponds to 0.5 or more of the maximum possible number of points at the time of the attestation.*

*The condition for obtaining a positive grade in the calendar control is the completion of all the work planned for this time.*

*To receive test for a course with an automatic grade, the student must have a grade of at least 60 points, pass homework test, complete all laboratory works, and prepare a report on laboratory works. The rating points obtained during the semester are translated into the corresponding grade according to the table below.*

***Table of correspondence between rating points and grades on the university scale:***

|  |  |
| --- | --- |
| ***Number of points*** | ***Grade*** |
| ***100-95*** | ***Excellent*** |
| ***94-85*** | ***Very good*** |
| ***84-75*** | ***Good*** |
| ***74-65*** | ***Satisfactory*** |
| ***64-60*** | ***Enough*** |
| ***Less than 60*** | ***Unsatisfactory*** |
| ***The conditions for admission are not met*** | ***Not allowed*** |

# Additional information on the educational component

The list of questions for the ICW and the exam are given in the Electronic Campus. In the case of remote or online courses on the subject of the educational component, certificates obtained in non-formal education are credited. Compliance of the certificate with the OK program is determined by the lecturer. The total number of recredited hours should not exceed 25%.

**The work programme of the educational component (syllabus) has been developed by:**

Department of Organic Chemistry and

Technology of Organic Substances,

Doctor of Chemical Sciences, Professor Andrey Fokin

Approved by Department of Organic Chemistry and Technology of Organic Substances (No.14 of 23.06.2024)

Agreed by Methodological Commission of Faculty of Chemical Technology (No. 10 of 21.06.2024)