

# Decision of the FIBAA Accreditation and Certification Committee



9<sup>th</sup> Meeting on March 22, 2023

## PROGRAMME ACCREDITATION

**Project Number:** 21/121, Cluster 1  
**Higher Education Institution:** Universitas Negeri Gorontalo  
**Location:** Gorontalo, Indonesia  
**Study Programmes:** Bachelor of Biology Education (S.Pd.)  
Bachelor of Chemistry Education (S.Pd.)  
Bachelor of Physics Education (S.Pd.)  
Bachelor of Geography Education (S.Pd.)

**Type of Accreditation:** initial accreditation

The FIBAA Accreditation and Certification Committee has taken the following decision:

According to § 7 (6) in conjunction with § 9 (1) of the FIBAA General Terms and Conditions within the framework of procedures for the award of the FIBAA Quality Seal for Programmes from January 1, 2021, the study programmes are accredited under conditions.

Period of Accreditation: March 22, ~~2023~~ to ~~March 21, 2028~~

The FIBAA Quality Seal is awarded.

Conditions:

### Bachelor of Biology Education (S.Pd.)

- **Condition:** The University completes the information in the Module handbooks regarding
  - a) module specific intended learning outcomes (ILO),
  - b) specifying the module specific assessments,
  - c) module description for the theses (see chapter 3.2).

### Bachelor of Chemistry Education (S.Pd.)

- **Condition 1:** The University completes the information in the Module handbooks regarding
  - a) module specific intended learning outcomes (ILO),
  - b) specifying the module specific assessments,
  - c) specifying contents of lectures, seminars and practical classes in instances where mixed methods are documented
  - d) module description for the theses,
  - e) updated literature (see chapter 3.2).

- **Condition 2:** The University takes the following steps to ensure sufficient safety standards in the laboratories:
  - a) The University proves the provision of a sufficient number of laboratory coats, goggles and adequate gloves for protecting students against chemical hazards.
  - b) The University develops a decisive plan (including scheduling and budgeting) to ensure sufficient safety standards in the laboratories concerning the technical equipment (see chapter 4.4).

#### **Bachelor of Physics Education (S.Pd.)**

- **Condition:** The University completes the information in the Module handbooks regarding
  - a) module specific intended learning outcomes (ILO),
  - b) specifying the module specific assessments,
  - c) module description for the theses (see chapter 3.2).

#### **Bachelor of Geography Education (S.Pd.)**

- **Condition 1:** The University includes teaching methods of Human Geography in the curriculum (see chapter 3.1).
- **Condition 2:** The University completes the information in the Module handbooks regarding
  - a) module specific intended learning outcomes (ILO),
  - b) specifying the module specific assessments,
  - c) module description for the theses,
  - d) updated literature (see chapter 3.2).

Proof of meeting these conditions is to be supplied by December 21, 2023.



## Assessment Report

---

---

**Higher Education Institution:**

Universitas Negeri Gorontalo, Sulawesi, Indonesia

---

**Bachelor programmes:**

1. Bachelor of Biology Education
2. Bachelor of Chemistry Education
3. Bachelor of Geography Education
4. Bachelor of Physics Education

---

**Qualification awarded on completion (all programmes)**

Bachelor of Education (S.Pd, Sarjana Pendidikan)

# General information on the study programmes

---

## Brief description of the study programmes:

### For all programmes

The **Bachelor of Biology Education (S.Pd.)**, the **Bachelor of Chemistry Education (S.Pd.)**, the **Bachelor of Physics Education (S.Pd.)** and the **Bachelor of Geography Education (S.Pd.)** are eight-semester programmes that aim to enable graduates to become educators in the field of Biology, Chemistry, Physics and Geography, respectively. The study programmes are designed to prepare education on the basis of teaching theory and its application as well as on knowledge and skills in the field of study. Graduates are prepared for careers as teachers, but also as research assistants, and entrepreneurs.

All study programmes comply with the National Qualifications Framework (KKNI)<sup>1</sup> level 6 which is equivalent to the European qualification framework of the Bologna declaration. KKNI as an educational framework provides a foundation for integrating learning outcomes, curriculum, and graduate competencies. In addition, these study programmes have implemented the extra-curricular “Freedom to Learn-Independent Campus” Programme (MBKM)<sup>2</sup> based on Permendikbud Number 3/2020 on National Standards of Higher Education. The regulation integrates theory and practice in developing student interests and talents through student exchanges between universities, internships, teaching in schools, research, humanitarian projects, entrepreneurship, independent projects, and village building.

### **Bachelor of Biology Education**

This study programme provides a comprehensive education of theoretical knowledge and practical skills in biology education. After completing their Bachelor of Biology education, graduates can work in public schools, in government agencies at the central and regional levels, in private companies engaged in education (schools and universities), but are also qualified for starting independent careers as entrepreneurs.

### **Bachelor of Chemistry Education**

Graduates of this study programme are equipped with solid concepts of chemistry, education, research, and entrepreneurship accompanied by professional skills and training that can be applied practically. Graduates can work as chemistry teachers in public schools, at government agencies at central and regional levels, in private institutions such as private schools and universities, but are also qualified for starting independent careers as entrepreneurs.

### **Bachelor of Physics Education**

Graduates of this study programme are qualified to become educators in the field of physics, physics education researchers, and leaders who have an entrepreneurial spirit. They have been trained by learning theories, practice, seminars, laboratories/practica, and training based on five

---

<sup>1</sup>Indonesian National Qualifications Framework (<http://kkni.ristekdikti.go.id/>)

<sup>2</sup>MBKM <http://merdekasiswa.kemdikbud.go.id/>

elements of competence consisting of Personality Development, Knowledge and Skills, Crafting Skills, Work Behavior, and Living in a Community. Graduates can work in public schools, at government agencies at central and regional levels, in private companies engaged in education (schools and universities), but are also qualified for starting independent careers as entrepreneurs.

### **Bachelor of Geography Education**

After completing education in this study programme, graduates can plan, implement a process, evaluate geography learning, and analyse physical and social problems based on the concepts of principles and approaches to geography. The study programme aims to educate graduates characterised by professionalism, reliability, independent, and personality to contribute to the improvement of human resources, especially the improvement of the quality of education. Graduates can work as geography teachers or geographers in government and corporate offices.

---

#### **Type of study programme:**

Bachelor programme (all programmes)

---

#### **Projected study time and number of ECTS credits / national credits assigned to the study programme:**

- Bachelor of Biology Education – 4 years/8 semesters, 144 credits, 230.4 ECTS
- Bachelor of Chemistry Education – 4 years/8 semesters, 146 credits, 233.6 ECTS
- Bachelor of Physics Education – 4 years/8 semesters, 144 credits, 230.4 ECTS
- Bachelor of Geography Education – 4 years/8 semesters, 144 credits, 230.4 ECTS

---

#### **Mode of study:**

For all programmes: full-time

---

#### **Didactic approach:**

For all programmes: study programme with obligatory class attendance

---

#### **Double/Joint Degree programme:**

For all programmes: no

---

#### **Scope (planned number of parallel classes) and enrolment capacity:**

- Bachelor of Biological Education: 65 per year
- Bachelor of Chemistry Education: 45 per year
- Bachelor of Physics Education: 45 per year
- Bachelor of Geography Education: 90 per year

---

#### **Programme cycle starts in:**

For all programmes: Summer semester (August)

---

#### **Initial start of the programme:**

- Bachelor of Biology Education: 1963
  - Bachelor of Chemistry Education: 1985
  - Bachelor of Physics Education: 1987
  - Bachelor of Geography Education: 2007
-

---

**Type of accreditation:**

For all programmes: initial accreditation

## Procedure

A contract for the initial accreditation of the Bachelor of Biology Education (S.Pd.), the Bachelor of Chemistry Education (S.Pd.), the Bachelor of Physics Education (S.Pd.) and the Bachelor of Geography Education (S.Pd.) was made between FIBAA and Universitas Negeri Gorontalo on November 4, 2021. On April 5, 2022, the HEI submitted a self-evaluation report, which included a detailed description of the programmes and further documents in order to prove that the criteria for programme accreditation are met.

At the same time, FIBAA appointed a review panel<sup>3</sup>. The HEI has agreed with the chosen experts. The panel consisted of:

**Daniel Burkhardt** (*onsite*)

University of Freiburg, Germany

Student of Mathematics (M.Sc.)

Completed: Polyvalenter Zwei-Hauptfach-Bachelor Mathematik und Latein (B.Sc.), (Albert-Ludwigs-Universität Freiburg, Germany)

**Dr. rer. nat. Florian Fiebelkorn** (*digital*)

University of Osnabrueck, Germany

Substitute Professor of Biology Didactics

(Teaching biology for all school types, experience with teaching contexts outside of Europe, sustainable behavior, biodiversity and sustainable nutrition, environmental and nutritional psychology)

**Prof. Dr. rer. nat. Dr.-Ing. Jens Hartung** (*onsite*)

Technical University Kaiserslautern, Germany

Chair of Organic Chemistry

(Chemistry, Business Chemistry, Chemical Engineering, Teacher Training in Chemistry)

**apl. Prof. Dr. Manfred Nutz** (*digital*)

University of Bonn, Germany

Adjunct Professor of Geography

(Urban and Regional Development, Housing and Real Estate Industry, Demographic Change, Economic Geography, Municipal Real Estate Management, Planning, Architecture, Business Development)

**PD Dr. Oliver Passon** (*digital*)

University of Wuppertal, Germany

Academic Board Member and Private Lecturer in Physics and its Didactics (Physics Teaching Post for all School Types (main, junior high, secondary and comprehensive school as well as grammar school and vocational college))

---

<sup>3</sup> The panel is presented in alphabetical order.

**Dr. Yuli Rahmawati** (*onsite*)

Universitas Negeri Jakarta, Indonesia

Head of Chemistry Education, Faculty of Mathematics and Natural Sciences

Lecturer of Chemistry Education

**Dr. Sigurd Riemer** (*digital*)

Well Done GmbH Kaijanserslautern, DAKKS, Germany

Certification Body Manager, Assessor in the field of ISO 17021, ISO 17024 and ISO 17065

(Education and further training, biology in general, biochemistry, evolution, ecology, natural sciences (physics, chemistry, toxicology), education and professional training, quality management)

FIBAA project manager:

Michael Stephan (*onsite*)

The assessment is based on the self-evaluation report, amended by further documents, as requested by the panel, and a hybrid conference. The hybrid conference took place on September 14, 15 and 16, 2022 via the video conferencing tool *Zoom* with four members of the panel team participating online. At the end of the hybrid conference, the panel has given a short feedback on its first impressions to representatives of the HEI.

The assessment report based on this was delivered to the HEI for comment on February 1, 2023. The statement on the report was given on February 15, 2023. It has been taken into account in the report at hand.



## Summary

The **Bachelor of Biology Education (S.Pd.)**, offered by Universitas Negeri Gorontalo fulfils with few exceptions the FIBAA quality requirements for bachelor programmes and can be accredited by the Foundation for International Business Administration Accreditation (FIBAA) for five years starting on March 22, 2023 and finishing on March 21, 2028, under condition. The programme is in accordance with the national and the European Qualification Frameworks and the European Standards and Guidelines in their applicable version valid as of the time of the opening of the procedure, and in accordance with the Bologna Declaration.

The panel members identified need for improvement regarding the following aspects<sup>4</sup>: modular structure of the study programme. They recommend the accreditation on condition of meeting the following requirement:

- **Condition:** The University completes the information in the Module handbooks regarding
  - module specific intended learning outcomes (ILO),
  - specifying the module specific assessments,
  - module description for the theses (see chapter 3.2).

Proof of meeting this condition is to be submitted by December 21, 2023.

The panel members identified several areas where the programme could be further developed. The panel recommends

- considering mentoring in instances where students face – for whatever reasons – difficulties in remaining below the maximum study time of seven years (see chapter Statistical Data)
- describing international aspects in the module descriptions (see chapter 1.2),
- having all documents and websites in English relevant for student application and admission been thoroughly checked by a native English speaker (see chapter 2),
- strengthening the role of English as language of science, for example by adding additional and more specific English courses into the curriculum and/or teaching more courses in English (see chapter 3.1),
- integrating additional practical teaching components within relevant modules, and also within the curriculum (see chapter 3.1),
- being more flexible in weighting the assessment aspects and reviewing the assessment weighting for each module (see chapter 3.1),
- implementing more oral examinations into the assessment catalogue (see chapter 3.1),
- stipulating the recognition of periods of study at other HEI outside the MBKM programme and the transfer of obtained credits (see chapter 3.2),
- compiling a comprehensive didactical concept which is also reflected in the module descriptions (see chapter 3.3),

---

<sup>4</sup> These aspects are asterisk criteria which means that they are essential for the study programme.

- presenting the existing international content more clearly on an operational basis, e.g. by describing the implementation of international aspects and the frequent use of international case studies in the module descriptions (see chapter 3.4),
- establishing exchange programmes on a regular basis (see chapter 3.4),
- opening international classes or/and double degree programmes (see chapter 3.4),
- focusing on acquiring part-time lecturers from neighbouring countries (see chapter 3.4),
- developing ideas of integrated usage of English literature in the modules (see chapter 3.4),
- elaborating in more concise manner benefits from seminars and workshops for acquiring competences in specific modules, and outlining such competences specifically in module descriptions (see chapter 3.5),
- integrating more opportunities or incentives for school- as well as out of school-internships in the curriculum (see chapter 3.6),
- implementing options for performing experimental lab simulations in the microteaching rooms, taking into account necessary standards (see chapter 3.6),
- making the philosophy of science and the discussion on the nature of science an integral part of the curricula (see chapter 3.6),
- formalising the involvement of students in the decision-making process through documentation in order to ensure consistency and clarity (see chapter 4.2),
- focusing on extra-university research institutes and NGOs for cooperations in terms of research and supervision of students (see chapter 4.3),
- equipping some of the teaching rooms with whiteboards and presentation kits (see chapter 4.4),
- aiming at cooperations with research institutions that would allow students to gain access to more modern laboratory equipment (see chapter 4.4),
- extending the three days period for book-lending and reviewing the process of updating the inventory of textbooks both in Indonesian and in English (see chapter 4.5),
- implementing a process that regulates content and procedure of communicating evaluation results to students, faculty and external stakeholders (see chapter 5),
- ensuring regular updating of the website and ensuring that all information is also available in English (see chapter 5).

The measures that the HEI takes in order to implement the recommendations of the panel members will have to be considered during the re-accreditation.

There is one criterion in which the programme exceeds the quality requirements:

- Ethical aspects (see chapter 3.1)

For the overall assessment of the programme, please refer to the quality profile at the end of this report.

## Summary

The **Bachelor of Chemistry Education (S.Pd.)**, offered by Universitas Negeri Gorontalo fulfils with few exceptions the FIBAA quality requirements for bachelor programmes and can be accredited by the Foundation for International Business Administration Accreditation (FIBAA) for five years starting on March 22, 2023 and finishing on March 21, 2028, under conditions. The programme is in accordance with the national and the European Qualification Frameworks and the European Standards and Guidelines in their applicable version valid as of the time of the opening of the procedure, and in accordance with the Bologna Declaration.

The panel members identified need for improvement regarding the following aspects<sup>5</sup>: Modular structure of the study programme; facilities and equipment. They recommend the accreditation on condition of meeting the following requirements:

- **Condition 1:** The University completes the information in the Module handbooks regarding
  - module specific intended learning outcomes (ILO),
  - specifying the module specific assessments,
  - specifying contents of lectures, seminars and practical classes in instances where mixed methods are documented
  - module description for the theses,
  - updated literature (see chapter 3.2).
- **Condition 2:** The University takes the following steps to ensure sufficient safety standards in the laboratories:
  - a) The University proves the provision of a sufficient number of laboratory coats, goggles and adequate gloves for protecting students against chemical hazards.
  - b) The University develops a decisive plan (including scheduling and budgeting) to ensure sufficient safety standards in the laboratories concerning the technical equipment (see chapter 4.4).

Proof of meeting these conditions is to be submitted by December 21, 2023.

The panel members identified several areas where the programme could be further developed. The panel recommends

- considering mentoring in instances where students face – for whatever reasons – difficulties in remaining below the maximum study time of seven years (see chapter Statistical Data)
- describing international aspects in the module descriptions (see chapter 1.2),
- having all documents and websites in English relevant for student application and admission been thoroughly checked by a native English speaker (see chapter 2),
- strengthening the role of English as language of science, for example by adding additional and more specific English courses into the curriculum and/or teaching more courses in English (see chapter 3.1),

---

<sup>5</sup> These aspects are asterisk criteria which means that they are essential for the study programme.

- reviewing the curriculum to further refining the concept of education in three steps (see chapter 3.1)
- being more flexible in weighting the assessment aspects and reviewing the assessment weighting for each module (see chapter 3.1),
- implementing more oral examinations into the assessment catalogue (see chapter 3.1),
- stipulating the recognition of periods of study at other HEI outside the MBKM programme and the transfer of obtained credits (see chapter 3.2),
- compiling a comprehensive didactical concept which is also reflected in the module descriptions (see chapter 3.3),
- including components of Education for Sustainable Development as an international component in the curriculum (see chapter 3.4),
- presenting the existing international content more clearly on an operational basis, e.g. by describing the implementation of international aspects and the frequent use of international case studies in the module descriptions (see chapter 3.4),
- establishing exchange programmes on a regular basis (see chapter 3.4),
- opening international classes or/and double degree programmes (see chapter 3.4),
- focusing on acquiring part-time lecturers from neighbouring countries (see chapter 3.4),
- developing ideas of integrated usage of English literature in the modules (see chapter 3.4),
- elaborating in more concise manner benefits from seminars and workshops for acquiring competences in specific modules, and outlining such competences specifically in module descriptions (see chapter 3.5),
- integrating more opportunities or incentives for school- as well as out of school-internships in the curriculum (see chapter 3.6),
- implementing options for performing experimental lab simulations in the microteaching rooms, taking into account necessary standards (see chapter 3.6),
- making the philosophy of science and the discussion on the nature of science an integral part of the curriculum (see chapter 3.6)
- formalising the involvement of students in the decision-making process through documentation in order to ensure consistency and clarity (see chapter 4.2),
- focusing on extra-university research institutes and NGOs for cooperations in terms of research and supervision of students (see chapter 4.3),
- equipping some of the teaching rooms with whiteboards and presentation kits (see chapter 4.4),
- extending the three days period for book-lending and reviewing the process of updating the inventory of textbooks both in Indonesian and English (see chapter 4.5),
- implementing a process that regulates content and procedure of communicating evaluation results to students, faculty and external stakeholders (see chapter 5),

- ensuring regular updating of the website and ensuring that all information is also available in English (see chapter 5).

The measures that the HEI takes in order to implement the recommendations of the panel members will have to be considered during the re-accreditation.

There is one criterion in which the programme exceeds the quality requirements:

- Ethical aspects (see chapter 3.1)

For the overall assessment of the programme, please refer to the quality profile at the end of this report.

## Summary

The **Bachelor of Physics Education (S.Pd.)**, offered by Universitas Negeri Gorontalo fulfils with few exceptions the FIBAA quality requirements for bachelor programmes and can be accredited by the Foundation for International Business Administration Accreditation (FIBAA) for five years starting on March 22, 2023 and finishing on March 21, 2028, under condition. The programme is in accordance with the national and the European Qualification Frameworks and the European Standards and Guidelines in their applicable version valid as of the time of the opening of the procedure, and in accordance with the Bologna Declaration.

The panel members identified need for improvement regarding the following aspects<sup>6</sup>: modular structure of the study programme. They recommend the accreditation on condition of meeting the following requirement:

- **Condition:** The University completes the information in the Module handbooks regarding
  - module specific intended learning outcomes (ILO),
  - specifying the module specific assessments,
  - module description for the theses (see chapter 3.2).

Proof of meeting this condition is to be submitted by December 21, 2023.

The panel members identified several areas where the programme could be further developed. The panel recommends

- considering mentoring in instances where students face – for whatever reasons – difficulties in remaining below the maximum study time of seven years (see chapter Statistical Data)
- describing international aspects in the module descriptions (see chapter 1.2),
- having all documents and websites in English relevant for student application and admission been thoroughly checked by a native English speaker (see chapter 2),
- strengthening the role of English as language of science, for example by adding additional and more specific English courses into the curriculum and/or teaching more courses in English (see chapter 3.1),
- being more flexible in weighting the assessment aspects and reviewing the assessment weighting for each module (see chapter 3.1),
- implementing more oral examinations into the assessment catalogue (see chapter 3.1),
- stipulating the recognition of periods of study at other HEI outside the MBKM programme and the transfer of obtained credits (see chapter 3.2),
- compiling a comprehensive didactical concept which is also reflected in the module descriptions (see chapter 3.3),
- updating the course materials by integrating aspects of Nature of Science as well as of Philosophy of Science (see chapter 3.3),

---

<sup>6</sup> These aspects are asterisk criteria which means that they are essential for the study programme.

- including components of Education for Sustainable Development as an international component in the curriculum (see chapter 3.4),
- presenting the existing international content more clearly on an operational basis, e.g. by describing the implementation of international aspects and the frequent use of international case studies in the module descriptions (see chapter 3.4),
- establishing exchange programmes on a regular basis (see chapter 3.4),
- opening international classes or/and double degree programmes (see chapter 3.4),
- focusing on acquiring part-time lecturers from neighbouring countries (see chapter 3.4),
- developing ideas of integrated usage of English literature in the modules (see chapter 3.4),
- elaborating in more concise manner benefits from seminars and workshops for acquiring competences in specific modules, and outlining such competences specifically in module descriptions (see chapter 3.5),
- integrating more opportunities or incentives for school- as well as out of school-internships in the curriculum (see chapter 3.6),
- implementing options for performing experimental lab simulations in the microteaching rooms, taking into account necessary standards (see chapter 3.6),
- making the philosophy of science and the discussion on the nature of science an integral part of the curriculum (see chapter 3.6),
- formalising the involvement of students in the decision-making process through documentation in order to ensure consistency and clarity (see chapter 4.2),
- focusing on extra-university research institutes and NGOs for cooperations in terms of research and supervision of students (see chapter 4.3),
- equipping some of the teaching rooms with whiteboards and presentation kits (see chapter 4.4),
- extending the three days period for book-lending and reviewing the process of updating the inventory of textbooks both in Indonesian and in English (see chapter 4.5),
- implementing a process that regulates content and procedure of communicating evaluation results to students, faculty and external stakeholders (see chapter 5),
- ensuring regular updating of the website and ensuring that all information is also available in English (see chapter 5).

The measures that the HEI takes in order to implement the recommendations of the panel members will have to be considered during the re-accreditation.

There is one criterion in which the programme exceeds the quality requirements:

- Ethical aspects (see chapter 3.1)

For the overall assessment of the programme, please refer to the quality profile at the end of this report.

## Summary

The **Bachelor of Geography Education (S.Pd.)**, offered by Universitas Negeri Gorontalo fulfils with few exceptions the FIBAA quality requirements for bachelor programmes and can be accredited by the Foundation for International Business Administration Accreditation (FIBAA) for five years starting on March 22, 2023 and finishing on March 21, 2028, under conditions. The programme is in accordance with the national and the European Qualification Frameworks and the European Standards and Guidelines in their applicable version valid as of the time of the opening of the procedure, and in accordance with the Bologna Declaration.

The panel members identified need for improvement regarding the following aspects<sup>7</sup>: Methods and scientific practice; modular structure of the study programme. They recommend the accreditation on condition of meeting the following requirements:

- **Condition 1:** The University includes teaching methods of Human Geography in the curriculum (see chapter 3.1).
- **Condition 2:** The University completes the information in the Module handbooks regarding
  - module specific intended learning outcomes (ILO),
  - specifying the module specific assessments,
  - module description for the theses,
  - updated literature (see chapter 3.2).

Proof of meeting these conditions is to be submitted by December 21, 2023.

The panel members identified several areas where the programme could be further developed. The panel recommends

- considering mentoring in instances where students face – for whatever reasons – difficulties in remaining below the maximum study time of seven years (see chapter Statistical Data)
- describing international aspects in the module descriptions (see chapter 1.2),
- including electives in world geography (see chapter 1.2),
- including aspects of global challenges in the MBKM programme (see chapter 1.2),
- having all documents and websites in English relevant for student application and admission been thoroughly checked by a native English speaker (see chapter 2),
- implementing more English courses into the curriculum and/or teaching more courses in English implementing more English courses into the curriculum and/or teaching more courses in English (see chapter 3.1),
- being more flexible in weighting the assessment aspects and reviewing the assessment weighting for each module (see chapter 3.1),
- implementing more oral examinations into the assessment catalogue (see chapter 3.1),

---

<sup>7</sup> These aspects are asterisk criteria which means that they are essential for the study programme.



- stipulating the recognition of periods of study at other HEI outside the MBKM programme and the transfer of obtained credits (see chapter 3.2),
- compiling a comprehensive didactical concept which is also reflected in the module descriptions (see chapter 3.3),
- including components of Education for Sustainable Development as an international component in the curriculum (see chapter 3.4),
- presenting the existing international content more clearly on an operational basis, e.g. by describing the implementation of international aspects and the frequent use of international case studies in the module descriptions (see chapter 3.4),
- establishing exchange programmes on a regular basis (see chapter 3.4),
- opening international classes or/and double degree programmes (see chapter 3.4),
- focusing on acquiring part-time lecturers from neighbouring countries (see chapter 3.4),
- developing ideas of integrated usage of English literature in the modules (see chapter 3.4),
- elaborating in more concise manner benefits from seminars and workshops for acquiring competences in specific modules, and outlining such competences specifically in module descriptions (see chapter 3.5),
- integrating more opportunities or incentives for school- as well as out of school-internships in the curriculum (see chapter 3.6),
- implementing options for performing experimental lab simulations in the microteaching rooms, taking into account necessary standards (see chapter 3.6),
- making the philosophy of science and the discussion on the nature of science an integral part of the curricula (see chapter 3.6),
- ensuring that qualifications in human geography are taken into account when appointing new faculty. The panel also recommends that new faculty should have experience in sustainability topics that come together with global change (see chapter 4.1).
- improving the school-related qualifications of the lecturers (see chapter 4.1),
- formalising the involvement of students in the decision-making process through documentation in order to ensure consistency and clarity (see chapter 4.2),
- focusing on extra-university research institutes and NGOs for cooperations in terms of research and supervision of students (see chapter 4.3),
- equipping some of the teaching rooms with whiteboards and presentation kits (see chapter 4.4),
- extending the three days period for book-lending and reviewing the process of updating the inventory of textbooks both in Indonesian and in English (see chapter 4.5),
- implementing a process that regulates content and procedure of communicating evaluation results to students, faculty and external stakeholders (see chapter 5),
- ensuring regular updating of the website and ensuring that all information is also available in English (see chapter 5).

The measures that the HEI takes in order to implement the recommendations of the panel members will have to be considered during the re-accreditation.

There is one criterion in which the programme exceeds the quality requirements:

- Ethical aspects (see chapter 3.1)

For the overall assessment of the programme, please refer to the quality profile at the end of this report.

## List of Tables

|   |   |
|---|---|
| Table 1: Statistical Data: Bachelor of Biology Education .....  | 20  |
| Table 2: Statistical Data: Bachelor of Chemistry Education .....  | 21  |
| Table 3: Statistical Data: Bachelor of Physics Education .....  | 22  |
| Table 4: Statistical Data: Bachelor of Geography Education.....   | <b>Fehler! Textmarke nicht definiert.</b> |
| Table 5: Percentage of students by region of origin .....   | 32  |
| Table 6: Study programme accreditation data .....   | 32  |
| Table 7: The graduates' field of work distribution.....   | 33  |
| Table 8: Name and degree of study programmes at UNG´s Faculty of Mathematics and Natural Sciences ..... | <b>Fehler! Textmarke nicht definiert.</b> |
| Table 9: Assessment criteria.....   | 45  |
| Table 10: Types of Scholarships and Scholarship Recipients.....   | 51  |
| Table 11: Guest lecturers from practice at the Faculty of Mathematics and Natural Sciences .....        | 54  |
| Table 12: Academic staff of the Faculty of Mathematics and Natural Sciences in 2022 .....               | 61  |
| Table 13: Number of Lecturers Participating in Pedagogic Training till 2021 .....                       | 64  |
| Table 14: Industrial Experience of Study Programme Lecturers.....                                       | 64  |
| Table 15: Organisational Structure of the Faculty of Mathematics and Natural Sciences.....              | 69  |
| Table 16: Stages of preparing curriculum documents.....   | 71  |
| Table 17: niversity Cooperations of the Faculty of Mathematics and Natural Sciences.....                | 72  |
| Table 18: Types and Numbers of UNG Library Collections .....  | 75  |
| Table 19a: Career Development Centre Activities .....   | 78  |
| Table 19b: Work Programme of the Alumni Association .....   | 79  |
| Table 20: Internal Process of Quality Assurance at UNG .....  | 82  |
| Table 21: Organisational Structure of UNG's Internal Quality Assurance System.....                      | 83  |
| Table 22: Student Assessment Indicators.....  | 84  |
| Table 23: Curriculum Overview: Bachelor of Biology Education.....                                       | 91  |
| Table 24: Curriculum Overview: Bachelor of Chemistry Education.....                                     | 100                                       |
| Table 25: Curriculum Overview: Bachelor of Physics Education.....                                       | 110                                       |
| Table 26: Curriculum Overview: Bachelor of Geography Education.....                                     | 115                                       |
| Table 27: Sample Laboratory Equipment Pool - Osnabrück University - Department of Biology .             | 126                                       |
| Table 28: Sample Equipment Pool – School Students Lab Biology - Osnabrück University.....               | 132                                       |

# Information

## Information on the Institution

Universitas Negeri Gorontalo (UNG) is a state-owned university based on teaching and education located in Gorontalo, Indonesia. Since its establishment in 1963, this institution has undergone eight status transformations, from Junior College Unsulutteng to Universitas Negeri Gorontalo (UNG) in 2004. The institution received Accreditation A from BAN-PT. UNG has 11 faculties which offer 83 study programmes, including four vocational, 55 undergraduates, two professional, 16 masters, and six doctoral programmes. Overall, UNG has 21,269 students, 959 lecturers, and 655 administrative workers. The undergraduate programmes Bachelor of Biology Education, Bachelor of Chemistry Education, Bachelor of Physics Education, and Bachelor of Geography Education are offered by the Faculty of Mathematics and Natural Sciences.

UNG's vision is to be the Leading University in the Development of Culture and Innovation Based on Regional Potential in the Southeast Asia Region in 2035. This vision is internationally oriented as UNG's commitment to improve the quality of education, research, and service towards global standards. To achieve this vision, UNG has set the following goals:

1. The increasing role of UNG in implementing education and teaching to produce sustainable high quality human resources;
2. Increasing research activities that create new science and technology to improve human life quality and standards;
3. Increasing the implementation of community service through dissemination and application of research and technology results;
4. Increasing partnership and networking that supports the application of science and technology, regional-based potential innovation, and cultural development; and
5. Implementing good, clean, and authoritative governance and services toward good university governance.

Currently, UNG is in the mopotihulo (establishing) stage of the five stages of the UNG development master plan until 2035. The mopotihulo stage is the achievement of competitive quality (2020-2024), which focuses on increasing competitiveness at the international level. Key indicators that focus on achievement in this period include 5 % of study programmes receiving international accreditation from FIBAA, AUN-QA, or ABET.

In addition, strengthening cultural development, network development, and research collaboration is directed at increasing joint research. This collaborative research is based on the development of the culture and local wisdom of Gorontalo and the Tomini Bay area to be introduced globally and sharpen UNG's innovations in education/teaching, research, and community service. Furthermore, the last two stages of UNG development are mohetopo (overshadowing, achieving national recognition, 2025-2029) and mobotulo (tracing, achieving Southeast Asia Recognition, 2030-2034).

UNG has established partnerships with several foreign universities (Malaysia, Philippines, Japan, Thailand, Japan, USA, and Germany). Finally, UNG believes that international accreditation and certification will be the basis for developing quality management at UNG in the future.

## Statistical Data

Table 1: Statistical Data: Bachelor of Biology Education

|  |   | 1. Cohort<br>2015 | 2. Cohort<br>2016 | 3. Cohort<br>2017 | 4. Cohort<br>2018 | 5. Cohort<br>2019 | 6. Cohort<br>2020 | 7. Co<br>20 |
|--|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------|
| # Study Places offered by HEI                      |   | 142               | 95                | 104               | 110               | 111               | 120               | 6           |
| # Applicants                                       | ∑ | 474               | 434               | 338               | 354               | 276               | 120               | 1           |
|  | f | 278               | 307               | 237               | 302               | 211               | 98                | 1           |
|  | m | 196               | 127               | 101               | 52                | 65                | 22                | 2           |
| Application rate                                   |   | 333,80%           | 456,84%           | 325,00%           | 321,82%           | 248,65%           | 100,00%           | 201,        |
| # First-Year Students (accepted applicants)        | ∑ | 72                | 58                | 78                | 82                | 73                | 58                | 5           |
|  | f | 55                | 45                | 62                | 67                | 59                | 50                | 4           |
|  | m | 17                | 13                | 16                | 15                | 14                | 8                 | 1           |
| Rate of female students                            |   | 76%               | 78%               | 79%               | 82%               | 81%               | 86%               | 74          |
| # Foreign Students                                 | ∑ | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0           |
|  | f | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0           |
|  | m | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0           |
| Rate of foreign students                           |   | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0           |
| Percentage of occupied study places                |   | 50,70%            | 61,05%            | 75,00%            | 74,55%            | 65,77%            | 48,33%            | 89,         |
| # Graduates  | ∑ | 40                | 21                | 1                 | 0                 | 0                 |                   |             |
|  | f | 30                | 13                | 1                 | 0                 | 0                 |                   |             |
|  | m | 10                | 8                 | 0                 | 0                 | 0                 |                   |             |
| Success rate (students who finished their studies) |   | 55,56%            | 36,21%            | 1,28%             | 0,00%             | 0,00%             | 0,00%             | 0,0         |
| Dropout rate (students who dropped their studies)  |   | 0,00%             | 0,00%             | 0,00%             | 0,00%             | 0,00%             | 0,00%             | 0,0         |
| Average duration of study                          |   | 5.01              | 4.9               | 3.8               | 0                 | 0                 | 0                 | 0           |
| Average grade of final degree                      |   | 3.28              | 3.36              | 3.57              | 0                 | 0                 | 0                 | 0           |

Table 2: Statistical Data: Bachelor of Chemistry Education

|  |   | 1. Cohort<br>2015 | 2. Cohort<br>2016 | 3. Cohort<br>2017 | 4. Cohort<br>2018 | 5. Cohort<br>2019 | 6. Cohort<br>2020 |
|--|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| # Study Places offered by HEI                      |   | 132               | 80                | 102               | 95                | 95                | 85                |
| # Applicants                                       | ∑ | 190               | 171               | 120               | 131               | 96                | 60                |
|  | f | 155               | 138               | 93                | 101               | 70                | 50                |
|  | m | 35                | 33                | 27                | 30                | 26                | 10                |
| Application rate                                   |   | 143,94%           | 213,75%           | 117,65%           | 137,89%           | 101,05%           | 70,59%            |
| # First-Year Students (accepted applicants)        | ∑ | 50                | 45                | 44                | 48                | 55                | 33                |
|  | f | 43                | 35                | 38                | 38                | 44                | 27                |
|  | m | 7                 | 10                | 6                 | 10                | 11                | 6                 |
| Rate of female students                            |   | 0,86              | 0,78              | 0,86              | 0,79              | 0,80              | 0,82              |
| # Foreign Students                                 | ∑ | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |
|  | f |                   |                   |                   |                   |                   |                   |
|  | m |                   |                   |                   |                   |                   |                   |
| Rate of foreign students                           |   | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |
| Percentage of occupied study places                |   | 37,88%            | 56,25%            | 43,14%            | 50,53%            | 57,89%            | 38,82%            |
| # Graduates  | ∑ | 52                | 73                | 68                | 46                | 51                | 45                |
|  | f | 40                | 59                | 50                | 36                | 43                | 35                |
|  | m | 12                | 14                | 18                | 10                | 8                 | 10                |
| Success rate (students who finished their studies) |   | 76,00%            | 75,56%            | 40,91%            | 0,00%             | 0,00%             | 0,00%             |
| Dropout rate (students who dropped their studies)  |   | 0,00%             | 0,00%             | 0,00%             | 0,00%             | 0,00%             | 0,00%             |
| Average duration of study                          |   | 5,48              | 4,75              | 5,00              |                   |                   |                   |
| Average grade of final degree                      |   | 3,28              | 3,29              | 3,28              |                   |                   |                   |

Table 3: Statistical Data: Bachelor of Physics Education

|  |   | 1. Cohort<br>2015/2016 | 2. Cohort<br>2016/2017 | 3. Cohort<br>2017/2018 | 4. Cohort<br>2018/2019 | 5. Cohort<br>2019/2020 | 6. Cohort<br>2020/2021 | 7. Cohort<br>2021/2022 |
|--|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| # Study Places offered by HEI                      |   | 158                    | 128                    | 197                    | 60                     | 60                     | 85                     | 45                     |
| # Applicants                                       | ∑ | 197                    | 173                    | 120                    | 110                    | 92                     | 61                     | 49                     |
|  | f |                        |                        |                        |                        |                        |                        |                        |
|  | m |                        |                        |                        |                        |                        |                        |                        |
| Application rate                                   |   | 124,68%                | 135,16%                | 60,91%                 | 183,33%                | 153,33%                | 71,76%                 | 108,89%                |
| # First-Year Students (accepted applicants)        | ∑ | 71                     | 46                     | 43                     | 36                     | 40                     | 28                     | 23                     |
|  | f | 48                     | 30                     | 30                     | 27                     | 36                     | 22                     | 20                     |
|  | m | 23                     | 16                     | 13                     | 9                      | 4                      | 6                      | 3                      |
| Rate of female students                            |   | 0,676056338            | 0,652173913            | 0,697674419            | 0,75                   | 0,9                    | 0,785714286            | 0,869565217            |
| # Foreign Students                                 | ∑ | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      |
|  | f | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      |
|  | m | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      |
| Rate of foreign students                           |   | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      | 0                      |
| Percentage of occupied study places                |   | 44,94%                 | 35,94%                 | 21,83%                 | 60,00%                 | 66,67%                 | 32,94%                 | 51,11%                 |
| # Graduates  | ∑ | 47                     | 34                     | 9                      | 0                      | 0                      | 0                      | 0                      |
|  | f | 35                     | 25                     | 7                      | 0                      | 0                      | 0                      | 0                      |
|  | m | 12                     | 9                      | 2                      | 0                      | 0                      | 0                      | 0                      |
| Success rate (students who finished their studies) |   | 66,20%                 | 73,91%                 | 20,93%                 | 0,00%                  | 0,00%                  | 0,00%                  | 0,00%                  |
| Dropout rate (students who dropped their studies)  |   | 0,00%                  | 0,00%                  | 0,00%                  | 0,00%                  | 0,00%                  | 0,00%                  | 0,00%                  |
| Average duration of study                          |   | 4,32                   | 4,42                   | 4,5                    | 0,0                    | 0,0                    | 0,0                    | 0,0                    |
| Average grade of final degree                      |   | 3,39                   | 3,39                   | 3,66                   | 0                      | 0                      | 0                      | 0                      |

Table 4: Statistical Data: Bachelor of Geography Education

|  |   | 1. Cohort<br>2015 | 2. Cohort<br>2016 | 3. Cohort<br>2017 | 4. Cohort<br>2018 | 5. Cohort<br>2019 | 6. Cohort<br>2020 | 7. |
|--|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|----|
| # Study Places offered by HEI                      |   | 50                | 52                | 60                | 90                | 70                | 60                |    |
| # Applicants                                       | ∑ | 230               | 213               | 185               | 257               | 190               | 236               |    |
|  | f | 105               | 116               | 76                | 159               | 109               | 196               |    |
|  | m | 125               | 97                | 109               | 98                | 81                | 40                |    |
| Application rate                                   |   | 460,00%           | 409,62%           | 308,33%           | 285,56%           | 271,43%           | 393,33%           | 4. |
| # First-Year Students (accepted applicants)        | ∑ | 46                | 30                | 34                | 81                | 66                | 58                |    |
|  | f | 16                | 16                | 14                | 43                | 54                | 46                |    |
|  | m | 30                | 14                | 20                | 38                | 12                | 12                |    |
| Rate of female students                            |   | 0,35              | 0,53              | 0,41              | 0,53              | 0,82              | 0,79              |    |
| # Foreign Students                                 | ∑ | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |    |
|  | f | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |    |
|  | m | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |    |
| Rate of foreign students                           |   | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |    |
| Percentage of occupied study places                |   | 92,00%            | 57,69%            | 56,67%            | 90,00%            | 94,29%            | 96,67%            | 8  |
| # Graduates  | ∑ | 43                | 28                | 27                | 33                | 24                | 15                |    |
|  | f | 16                | 16                | 11                | 19                | 11                | 13                |    |
|  | m | 27                | 12                | 16                | 14                | 13                | 2                 |    |
| Success rate (students who finished their studies) |   | 93,48%            | 93,33%            | 79,41%            | 40,74%            | 36,36%            | 25,86%            | 5  |
| Dropout rate (students who dropped their studies)  |   | 0,00%             | 0,00%             | 0,00%             | 0,00%             | 0,00%             | 0,00%             |    |
| Average duration of study                          |   | 4,47              | 4,21              | 4,18              |                   |                   |                   |    |
| Average grade of final degree                      |   | 3,25              | 3,26              | 3,29              |                   |                   |                   |    |



## Appraisal

In all four programmes, number of applicants exceed by far number of study places offered by the University, with the Chemistry programme being an exception in the past two years. Based on profiles the University requests from applicants to be fulfilled, some places every year remain unallocated, also showing high requirements and entry restrictions to ensure successful graduation of students. “Approval for this concept, according to the university, arises from pleasingly low drop-out rates within the four programmes under review. All students that have started the programme since 2015 have graduated or are still in the programme at the time of the assessment (2022). Based on the regulation of the Minister of Education And Culture, Research And Technology No 17 of 2020, a student's study period is a maximum of seven years. Because of this, students will only be dropped out if their study period exceeds seven years. The panel also acknowledges that the pandemic situation may have it made difficult for many students to finish studies within the projected study time, but suggests to keep on monitoring average duration of study thoroughly (see also condition in chapter 5). The panel recommends considering mentoring in instances where students face – for whatever reasons – difficulties in remaining below the maximum study time of seven years.

There are no foreign students in all four programmes, attributed to the fact that the programmes are positioned as teacher education programmes for Indonesia.

There is a high rate of female students in all programmes, usually between 70 and 90 % in recent cohorts.

The average time to graduation has been slightly decreasing in all four programmes; the average duration of study does is usually around 4.5 years and exceeds 5 years only for one cohort (Bachelor of Chemistry Education 2015). All variations in the number of applicants, the number of foreign students and drop-outs are thoroughly evaluated by the University.

# Programme Description and Appraisal in Detail

## 1. Objectives

### 1.1 Objectives of the study programmes (Asterisk Criterion)

The vision of Universitas Negeri Gorontalo (UNG) aims at becoming an international University, particularly visible in the Southeast Asian region. One of the main priorities of the vision is to qualify graduates to compete globally on job-markets. In order to achieve this aim, the curriculum of each study programme implements aspects of international perspective. The study programmes' curricula are developed with reference to the Indonesian Qualifications Framework (KKNI) and in accordance with level 6 (out of 9 qualification levels). This level is similar to level 6 of the European Qualifications Framework (EQF) and in accordance with study programme association agreements (Mathematics and Natural Science Forum) in Indonesia.

The objectives of the four respective Bachelor of Education programmes are laid down in the Academic Guidelines of the Faculty of Mathematics and Natural Sciences. The objectives aim at educating competent and qualified candidates for natural sciences teaching in Biology, Chemistry, Physics and Geography. In addition, the study programmes aim at educating students to be able to become entrepreneurs or research assistants.

The Programme Learning Objectives (PLO) of all study programmes consist of General Skills, Attitudes, Particular Skills and Knowledge Mastery. The PLOs of all study programmes in terms of general skills and attitudes comprise religious, civic, ethical objectives, but also skills to understand and apply expertise in the respective field of education to the rules of community life, to contribute to the development of regional potential. More objectives in terms of general skills and attitudes include the ability to teamwork as well as the respect for a diverse society and to internalise an independent, endeavor, and entrepreneurial spirit.

#### **Bachelor of Biology Education**

The vision of the Biology Education Study Programme aims at qualifying excellent students for succeeding on a competitive job-market, exerting high demand in positions associated with management of biological resources based on cultural and regional potential of Southeast Asia in the field of biology. The curriculum of the study programme is designed to evolve this vision into various courses along the curriculum by developing personality competences, gaining knowledge and skills, improving expertise and work behaviour, as well as integrating aspects of social life.

The programme specific learning objectives for the Bachelor of Biology Education are as follows:

#### **Particular skills**

- Having an independent motivation to follow the development of biological science and learning continuously as a scientific basis for profession;
- Having the ability to plan, design, implement and evaluate biology learning with an active student approach by utilising sources, media and local environmental potential in accordance with and guidance of the school curriculum within the TPCK (Technological Pedagogical Content Knowledge) framework of the SSP (Subject-specific Pedagogy) in accordance with the applicable quality standards;

- Able to improve the biology learning process carried out through action research;
- Able to apply biology learning methods that have been developed in an innovative way;
- Able to provide assistance to students in the scope of learning;
- Able to assist students in the learning situation;
- Having the ability to communicate the results and outputs related to biology education and learning biology in English;
- Mastering work safety and skills as well as managerial ability in managing school classrooms and laboratories by utilising the development of science and technology.

#### **Additional special skills as a Biology teacher**

- Able to create innovative and creative biology learning practices in accordance with life skills, based on local potential and wisdom, and future-oriented by utilising the progress of science, technology, and art;
- Able to assist students in the learning process of biology based on the characteristics and potential of students so that optimal learning outcomes are obtained;
- Able to create innovative and creative findings to improve the quality of present and future biology education through scientific research, based on potential and local wisdom by utilising the progress of science and technology;
- Able to publish Biology education findings;
- Planning and developing activities in biology / natural science laboratory at the school;
- Managing the laboratory activities of school/ madrasah;
- Able to create products of biological education entrepreneurs by utilising science and technology.

#### **Additional Special Skills as an Entrepreneur in Biology Education**

- Able to run a biology (education) enterprise.

#### **Knowledge Mastery**

- Mastering philosophies, approaches, models, methods, media, and evaluation to support biology learning in future-oriented schools, based on life skills and local potential and wisdom;
- Mastering philosophy, concept, principles, research methods of biological education at school level, as well as those related to biology education policy;
- Mastering the philosophy, approach, methods, models, media, and evaluation of learning to support entrepreneurial skills in order to improve the quality of learning in schools;
- Mastering concepts, procedures, and management principles of the school science laboratory.

## **Bachelor of Chemistry Education**

The target of the Chemistry Education Study Programme is to become an excellent, innovative and cultured study programme in the Southeast Asia Region in 2035. It aims to

- Provide excellent, and culture-driven chemistry education;
- Develop and conduct research in innovative Chemistry Education based on local and regional potential advantages;
- Organise community service in the field of chemical education and its application which is oriented towards community empowerment;
- Improve partnership networks both locally, nationally and internationally;
- Organise good, clean and authoritative governance and services.

The programme specific learning objectives for the Bachelor of Chemistry Education are as follows:

### **Particular skills**

- Able to plan, design, run, and evaluate the chemistry learning in school level in guided manner based on the characteristics of study material and students through scientific approach by using various learning sources and Science, Knowledge, and Art-based learning media, as well as local environment potential in accordance with standards of content, process, and assessment;
- Able to apply various chemistry learning models that are appropriate with the characteristic of study material and students;
- Able to plan, implement, and evaluate laboratory practical training by utilising resources available, based on the standard of contents, processes, and assessment;
- Able to make conversation in English whether for chemistry learning or daily activities;
- Able to communicate scientific aspects associated with chemistry teaching, and everyday-life in society in English;
- Able to write scientific articles based on results from educational research for being published in national and or international journals;
- Able to apply chemistry education concept and basics of chemistry in competition and research grants activities.

### **Knowledge Mastery**

- Understanding theoretical concepts of the structure, properties of molecules, and principles of chemical transformation, as well as basic techniques of laboratory practice, in particular separation, synthesis, identification, and characterisation of chemicals;
- Understanding principles, theories, and methods of learning and learning process as well as the personality and development of students;
- Mastering basic principles of chemistry laboratory management and being able applying this competence for solving school laboratory problems;
- Mastering basic principles and use of software to solve chemical problems and chemistry learning process;

- Mastering educational research methods to solve chemistry education problems;
- Mastering the concept of writing scientific papers in chemistry education;
- Mastering concepts of leadership and entrepreneurship in the development of culture and innovation in chemistry education;
- Mastering the basics of English that can be used for English conversation both in academic and non-academic activities.

### **Bachelor of Physics Education**

The target of the Physics Education study programme is to be the Leading Study Programme of Physics Education in the Southeast Asia Region in 2035. It aims to develop

- diversified education and learning based on technology that is effective, efficient, and tested in order to produce professional, reliable, independent graduates who have an entrepreneurial culture and religious morality.
- high-quality physics-related research activities and publications at national and international levels.
- quality community service activities by disseminating science and technology.
- the capacity and competence of the Physics Education study programme resources through cooperation at the local, national, and international levels in supporting the implementation of the Tridharma (three pillars) of higher education (education, research, community service).

The programme specific learning objectives for the Bachelor of Physics Education are that graduates develop the following abilities:

#### **Particular skills**

- To create physics learning tools independently according to the needs of users, both schools and the public, based on the scientific rules and principles of instructional design;
- To create physics learning tools for high schools independently by using pedagogical content knowledge analysis in accordance with the current curriculum, principles of instructional design, scientific approach, science and technology utilisation, and the surrounding natural environment;
- To analyse, find the source, and solve the physics instrumentation problems occurring in the learning process and in the laboratory management according to the scientific rules of physics;
- To analyse and propose various alternatives to problems in relation to physics learning media and physics laboratory management, as well as to conclude them for making right decision;
- To improve the quality, effectiveness, and efficiency of physics learning tools independently based on the scientific rules and principles of innovation;

- To promote the importance of learning physics for students, students' parents, and the general public through conventional or cutting edge communication media that are effective and relevant.

### **Knowledge Mastery**

- Mastering basic educational concepts in terms of student development, learning theories, nature of science, and scientific mindset;
- Mastering innovative learning methods oriented to personal, social, and academic skills (life skills) in physics;
- Mastering graduate competency standards, content standards, process standards, and assessment standards for physics education in high schools;
- Mastering principles of assessment in physics to analyze the learning challenges and success of students (through diagnostic, formative, and summative) as well as utilizing the results to design Physics learning that suits student characteristics;
- Mastering principles of science-based media development in physics learning and contextual technology, especially ICT (Information and Communication Technology) and the surrounding environment;
- Mastering resource management in classrooms, physics laboratories, and educational institutions.

### **Bachelor of Geography Education**

The vision of the Geography Education study programme is the realisation of an excellent and innovative Geography Education Study Programme in the Southeast Asia Region in 2035. It aims at

- administering quality, effective, efficient, tested technology-based education and learning to produce professional, reliable, independent, cultural entrepreneurs and religious morals graduates.
- conducting an outstanding research activity in geography education, the geography of innovation as well as the appropriate technologies and widely publicised at the national and international levels.
- disseminating knowledge, research results, technology, and learning innovations in the field of Geography Education and Geography Science through community service.
- enhancing the capacity and competence of the Geography Education Study Programme resources through cooperation at the local, national and international levels in supporting the implementation of the three pillars of higher education.

The programme specific learning objectives for the Bachelor of Geography Education are as follows:

#### **Particular skills**

- Able to plan, implement, and evaluate/assess Geography learning by utilising various science and technology-based learning sources;

- Able to formulate geosphere data and information both physical aspects and human aspects for geography learning and research;
- Able to determine the solution to the earth's problems as a system by using theories, approaches, principles of Geography for wise decision-making and increasing geographic literacy;
- Able to process, analyse, present geosphere data, and information using geospatial technology for geography learning and research;
- Able to apply regional theories for sustainable regional planning and development.

### **Knowledge Mastery**

- Able to analyse the characteristics of the material (content knowledge), characteristics of students and choose approaches, strategies, models, methods, and assessments based on theories and principles of active, innovative, creative, effective, and fun education in every geography learning
- Able to analyse the relationships between physical aspects in the geosphere for geography learning and research.
- Able to analyse the relationships between human aspects in the geosphere for geography learning and research.
- Able to analyse the earth as a system with various interactions, interconnections and their implications for decision making in the context of geographic literacy.
- Able to explain the concepts and methods of acquiring geosphere data and information using geospatial technology in school learning and geography research.
- Able to analyse regional characteristics and regionalisation based on the principles and geographic approaches.
- Able to analyse environmental resources effectively and efficiently to support sustainable development and find solutions to environmental problems and disasters
- Able to arrange scientific work based on the principles of the scientific method in an accountable and reliable

Having acquired these skills, graduates shall be able to work as Geography teachers at the primary and secondary level, as professionals in government and non-government agencies or as entrepreneurs.

### **Appraisal:**

The qualification objectives of the programmes are explained and convincingly presented in relation to the target group, targeted professional field and societal context of the discipline. The qualification objectives embrace academic proficiency, comprehensive employability, as well as the development of the individual student's personality. The panel emphasises that the qualification objectives are explicitly not limited to the teaching profession, but also aim at opening alternative career paths.

The subject-specific and extra-curricular qualification objectives and skills to be acquired correspond with the aspired level at graduation which is level 6 for all programmes. Moreover, they take into account the requirements of the national qualification framework.

|      |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|------|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 1.1* | Objectives of the study programme (Asterisk Criterion) |             |                              | X                          |                                    |      |

## 1.2 International orientation of the study programme design (Asterisk Criterion)

The vision and mission of each study programme explicitly includes an international orientation (UNG Master plan 2035). This plan aims at preparing graduates to work in positions world-wide. To support this vision, mastery of foreign languages is essential. Each study programme designs a curriculum by including foreign language skills in the teaching and learning process. In addition to the mastery of foreign languages, each study programme also includes international content in the curriculum. For example, the cultural insight module includes international culture as one of the topics in the learning process.

The improvement of foreign language skills for graduates is pursued by requiring the TOEFL score standard as a requirement for the thesis exam. The thesis exam is also carried out bilingually. To stimulate students to be able speaking foreign languages, study programmes develop modules using media and foreign language teaching materials and bilingual learning. In addition, modules and thesis exams are carried out using a foreign language.

Furthermore, academic staff's educational background and international experience are expected to support prospective graduates to gain international insights and perspectives. Several academic staff members have been actively involved in various international activities, such as seminars or conferences and training in several countries such as Sri Lanka, the Philippines, Japan, Germany, Thailand and the USA. Lecturer experience is important to enrich the learning process, such as lecture material provided by comparing perspectives from various countries.

In addition, study programmes regularly hold international seminars, research collaborations abroad, send students to attend international seminars or to take part in the “Sakura Science Programme” (in collaboration with EHIME University Japan).

### Appraisal:

The panel could not see the international design appropriately from the written documentation (see recommendation chapter 3.4). However, during the assessment conference the panel learned that although the study programmes’ main objective is to educate graduates for regional teaching jobs, the designs of the study programmes appropriately take into account the required international aspects, with respect, too, to its graduates’ employability.

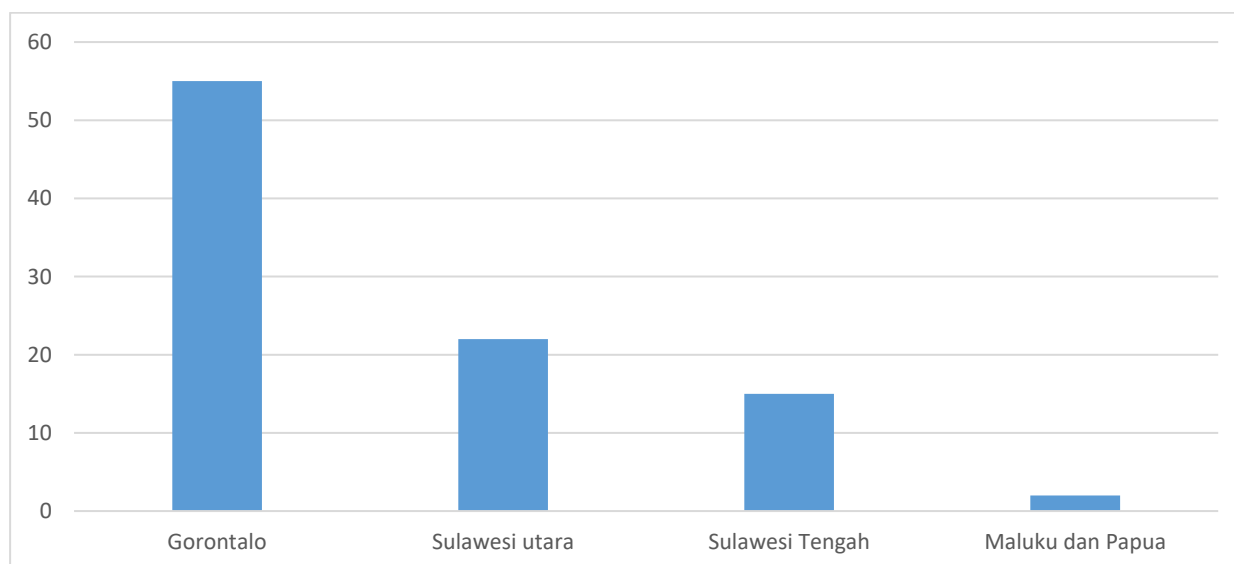


|   | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|---|-------------|------------------------------|----------------------------|------------------------------------|------|
| 1.2* International orientation of the study programme design (Asterisk Criterion) |             |                              | X                          |                                    |      |

### 1.3 Positioning of the study programme

Apart from Gorontalo, prospective students of the four study programmes mostly come from the eastern part of Indonesia, especially the central and northern Sulawesi, Maluku and Papua regions. Data from prospective students shows that around 39 % of students come from outside of Gorontalo. A correlation between student percentage and geographical origin is displayed in the following table:

**Table 5: Percentage of students by region of origin**



Source: Academic bureau

According to the self-evaluation report (page 12), the main reasons for students to choose their education from one of the four study programmes relates to:

1. All study programmes train graduates as teachers. Job opportunities as teachers are ample given the significant need for teachers in Indonesia, and a projected demand of one million teachers needed per annum until the year of 2024.
2. All study programmes have been accredited A/Excellent by the National Board of Accreditation for Higher Education (BAN-PT)<sup>8</sup>. In the area of northern Sulawesi, Maluku and Papua region, nine other universities are competing in the same study programmes. The advantage of the study programmes compared to similar programmes in the area is that all study programmes at UNG have been accredited A. Data on the results of study

<sup>8</sup> [https://www.banpt.or.id/direktori/prodi/pencairan\\_prodi.php](https://www.banpt.or.id/direktori/prodi/pencairan_prodi.php), last call August 11, 2022

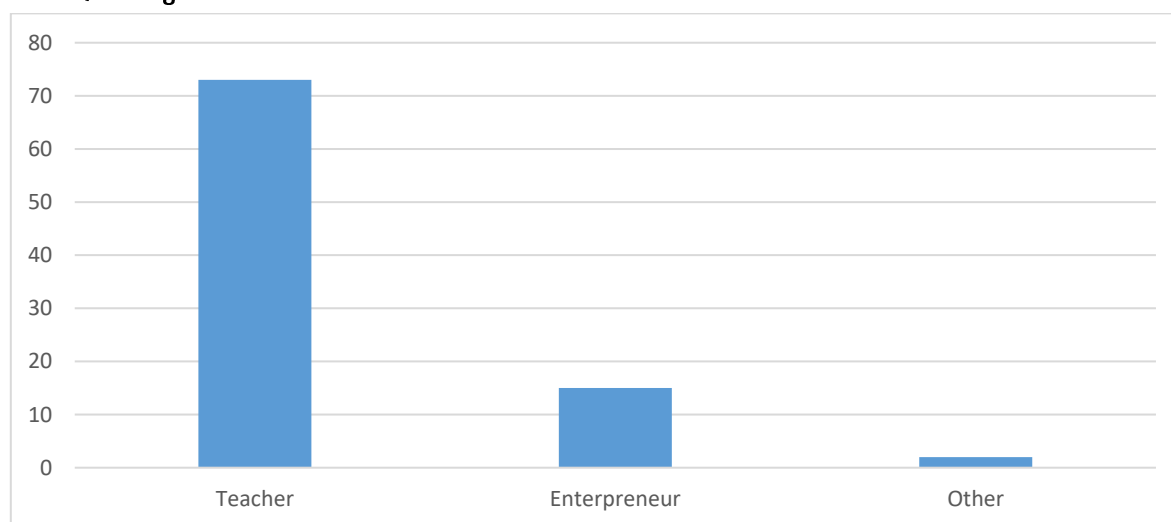
programme accreditation can be seen in the table below.

**Table 6: Study programme accreditation data**

| HEIs                                     | Programme Accreditation from BAN-PT |           |         |           |
|--|-------------------------------------|-----------|---------|-----------|
|  | Biology                             | Chemistry | Physics | Geography |
| Universitas Negeri Gorontalo             | A                                   | A         | A       | Excellent |
| Universitas Tadulako                     | B                                   | A         | B       | B         |
| Universitas Negeri Manado                | B                                   | B         | B       | B         |
| Khairun University, Ternate              | B                                   | B         | B       | B         |
| Universitas Negeri Papua                 | B                                   | B         | B       | -         |
| IAIN Ambon                               | B                                   | -         | B       | -         |
| Darussalam University Ambon              | B                                   | C         | B       | -         |
| Muhammadiyah University of Luwuk Banggai | C                                   | -         | C       | -         |
| Universitas Cendrawasih                  | B                                   | B         | C       | B         |
| Universitas Pattimura                    | B                                   | B         | B       | B         |

Graduates of the study programme are Bachelors of Education. Therefore, the main competence possessed by graduates is as a teacher. Apart from being a teacher, another competence possessed by graduates is to be an entrepreneur. Based on the results of the tracer study<sup>9</sup>, more than 70 % of study programme graduates work as teachers and 15 % work as entrepreneurs. The rest work in other sectors. The data from the tracer study can be seen in the figure below.

**Table 7: The graduates' field of work distribution**



## Appraisal:

For all four study programmes, the reasons given for their positioning in the educational market are plausible. The arguments in support of graduate employability on the basis of the stated qualification objectives are convincingly presented. The future fields of employment for graduates

<sup>9</sup> <https://tracerstudy.ung.ac.id>, last call October 20, 2022

are plausibly set forth, also for careers in institutions, administrations or municipalities. Moreover, all four study programmes are convincingly integrated into the HEI's overall strategic concept as teacher education is an important part of UNG's profile. The qualification goals are in line with the HEI's mission and strategic planning.

|       | Exceptional  | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|-------|--|------------------------------|----------------------------|------------------------------------|------|
| 1.3   | Positioning of the study programme   |                              |                            |                                    |      |
| 1.3.1 | Positioning of the study programme in the educational market                         |                              | X                          |                                    |      |
| 1.3.2 | Positioning of the study programme on the job market for graduates („Employability“) |                              | X                          |                                    |      |
| 1.3.3 | Positioning of the study programme within the HEI's overall strategic concept        |                              | X                          |                                    |      |

## 2. Admission

Student admission is regularised by

1. the Regulation of The Minister of Education Number 6 of 2020 Concerning Admission as Bachelor's Degree Freshmen at State Higher Education Institutions and
2. the Regulation of the Rector of Universitas Negeri Gorontalo Number 2 by 2020 Concerning Academic Rule and Regulation of Universitas Negeri Gorontalo.

Universitas Negeri Gorontalo (UNG) is a state University, so there are three admission schemes for Bachelor programmes that are in accordance with national standards and regulations.

1. SNMPTN (Seleksi Nasional Masuk Perguruan Tinggi Negeri, National Entrance Selection of State University) is the first batch of the University's undergraduate admission process. SNMPTN is a portfolio analysis admission scheme for students from all over Indonesia based on the applicants' academic and non-academic achievements during their high school study and their school's national accreditation status. It is organised by a committee appointed by the government (LTMPT/Lembaga Tes Masuk Perguruan Tinggi - University Entrance Test Institute). SNMPTN does not require applicants to sit for an exam. The selection process weights applicants' eligibility from their performance reports of the last five semesters in high school, their portfolios and the accreditation of the high school from which they come from. The portfolio consists of:
  - a) Letter of personal statement (which includes information on education, experience, and achievement during high school)
  - b) Letter of motivation and study commitment (information on students' motivation in choosing the programme and financial support).
2. SBMPTN (Seleksi Bersama Masuk Perguruan Tinggi Negeri, Joint Entrance Selection of State University). SBMPTN is a computer based written test. It is the second batch of University admission process for undergraduates managed by LTMPT. SBMPTN exams include academic aptitude test and specific subject-based test. The academic aptitude test measures verbal, numerical and reasoning skills and potentials. Meanwhile, the specific subject-based test examines applicants' understanding of several high-school subjects such as Mathematics, Physics, Biology, and Chemistry, Sociology, Economics, Geography, History and English. All test materials are prepared by a national committee.
3. Mandiri Selection (Independent Selection, UNG Entrance Test). The Mandiri Selection is also a computer-based written test. It is the last batch of undergraduate student selection and conducted independently by UNG. Similar to SBMPTN, Mandiri Selection requires students to sit for general scholastic test and specific subject based test. The test materials for Mandiri Selection are prepared by the University.

The University has set the quota for SNMPTN, SBMPTN and Mandiri in the percentage of minimum 20 %, minimum 40 %, and minimum 30 %, respectively. This division is set by the Rector of UNG

in accordance with national regulation<sup>10</sup> to open equal opportunities to all prospective students from any school in Indonesia.

For international students, there are additional requirements. To enrol at UNG, students are expected to provide the following documents

1. Curriculum Vitae;
2. Copy of High School certificate and transcript that have been legalised by the authorised official;
3. Letter of Recommendation published by Indonesian Embassy in the country of origin;
4. Copy of passport with a minimum validity period of 1 (one) year;
5. Letter of Understanding declaring that during a time of being student, the applicant does not work, will not be involved in any political activity, and is willing to comply with Laws and Regulations;
6. Letter of Health Statement from authorised physician;
7. Health and accident insurance (full cover) which applies in Indonesia during the study.

Prospective students are also required to join the Indonesian Language for Foreign Speakers (BIPA) Programme if the Indonesian language skills are considered poor. The decision is being taken by the Head of the Study Programme. The information on admission are available on the websites of UNG<sup>11</sup>. Indonesian language skills are assessed by The Indonesian Language Proficiency Test (UKBI). UKBI is developed based on the Indonesian language proficiency standards (BPPB Kemendikbudristek, 2021). The test taker will be assessed on five aspects: listening, grammar, reading, writing, and speaking. The UKBI is conducted by the Language Center of UNG.

There is counselling for prospective students both offline and online. Offline counselling can be done during the annual dies natalis education fair organised by UNG or high school visits UNG regularly conducts in Gorontalo and its surrounding areas.

Prospective students will get the information about the study programmes from the official website of the Faculty of Mathematics and Natural Science<sup>12</sup>. UNG's official website also provides a Q&A page. Prospective students can also access information by telephone (telephone numbers are available on respective website) or personally, by visiting the UNG Information Center.

Study programmes in Mathematics and Science Faculty do not require any professional experience for applicants.

Foreign language proficiency requirements for prospective students are part of the entrance exam through the SBMPTN and independent selection. Furthermore, it is mandatory for students who will get a bachelor's degree to have English language skills by a TOEFL score of at least 450 according to the UNG Academic Guidelines. All study programmes include a mandatory course in English (two Indonesian credits, equivalent to approximately 3,2 ECTS credits) and courses where language of instruction is English and Bahasa Indonesian.

The information of the registration procedure for the local and foreign prospective students is available at [www.ung.ac.id](http://www.ung.ac.id) or at <http://pmb.ung.ac.id>. The admission procedure and acceptance

---

<sup>10</sup> cf. Regulation of the Minister of Education and Culture No.6 of 2020

<sup>11</sup> <https://www.ung.ac.id/en/home/international>, last call August 11, 2022

<sup>12</sup> <https://fmipa.ung.ac.id>, last call October 20, 2022

decision are communicated within the institution as regulated in the Rector's Decree Number 4/UN47/PD/2022. The result of the selection is carried out by the UNG SNMPTN Central Committee.

The results of the SNMPTN selection are announced by the Central Committee simultaneously through electronic media and other such as the <https://www.snmptn.ac.id> page. Furthermore, UNG announces simultaneously on the <https://pmb.ung.ac.id> pages, UNG media, and newspaper.

Allocating study places based on results from the SNMPTN tests is conducted by the Ministry of Research, Technology, and by the Higher Education Central SBMPTN Committee Team based on the results from respective examinations. The results of the selection carried out by the UNG SBMPTN committee are sent to the SBMPTN Central Committee. The announcement of the SBMPTN results is announced by the Central Committee simultaneously through electronic media such as the <https://sbmptn.ac.id> page.

The results of the UNG Entrance Test are announced simultaneously at <https://pmb.ung.ac.id>, and UNG media such as campus information boards. The results of the selection of new students can be accessed by students via smartphones using their accounts or access through the website for each admission type, or via newspaper. Applicants who do not pass can make a complaint through the UNG information center or directly to the Academic Bureau of Students Affairs and Planning (BAKP).

## Appraisal:

The admission requirements are defined and comprehensible. The national requirements are presented and taken into account.

Applicants can directly turn to a student counselling service (University Information Centre) for clarification of specific questions, of personal aptitude of career perspectives etc. Personal dialogue between applicants and UNG is provided by defined office hours, by telephone, via e-mail.

The selection procedures follow the national regulations of the Republic of Indonesia. The procedures are transparent and ensure that qualified students are admitted.

Professional experience is not required for any of the four study programmes.

The admission requirements regarding foreign language proficiency ensure that students are able to successfully complete the study programme (with regard to modules, additional literature, utilisation of counselling services and extracurricular activities).

The admission procedure is described, documented and accessible for interested parties. The admission decision is based on transparent criteria and is communicated in writing to the applicants. All information is available on the respective websites of UNG, the study programmes and the committee appointed by the government (LTMPT) that is responsible for the SNMPTN and SBMPTN admission processes for **Bachelor programmes**. However, given misleading translations of information on internet pages in English language, the panel strongly recommends having all English documents and websites relevant for student application and admission been thoroughly checked by a native English speaker. For instance, the "letter of understanding" for international students is called the "letter of recommendation" on the website<sup>13</sup>, in addition, the website for admission of international students contains several misprints and misspellings.

---

<sup>13</sup> <https://www.ung.ac.id/en/home/international>, last call October 20, 2022

Admission requirements and the process of admitting international students, according to the panel's view, seems not as self explanatory to foreigners, as applicants familiar with the Indonesian system may regard it to be (e.g. information on <https://www.ung.ac.id/en/#admission>, international students option tab). Therefore, the panel recommends reviewing and revising any information associated with international student application and admission, possibly by seeking support from a non-Indonesian citizen. The panel suggests including information of international students' admission procedure on the website, and informative links such as accommodation, visa, teaching and learning etc.

|   | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|---|-------------|------------------------------|----------------------------|------------------------------------|------|
| 2.1* Admission requirements (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 2.2 Counselling for prospective students  |             |                              | X                          |                                    |      |
| 2.3* Selection procedure (if relevant)  |             |                              | X                          |                                    |      |
| 2.4(*) Professional experience (if relevant; Asterisk Criterion for master programmes that require professional experience) |             |                              |                            |                                    | X    |
| 2.5* Ensuring foreign language proficiency (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 2.6* Transparency and documentation of admission procedure and decision (Asterisk Criterion)                                |             |                              | X                          |                                    |      |

### 3. Contents, structure and didactical concept of the programme

#### 3.1 Contents

##### Logic and conceptual coherence

To improve legibility, curricular structures of each study programme are shown in the Annex.

Each curriculum consists of a number of subjects which are classified as compulsory and elective. Compulsory subjects are further divided into three categories: national-level, university-level, and department-/study programme-level subjects.

For all study programmes, the curriculum consists of

- National-level compulsory subjects (NAS; eight credits): Religious Education; Pancasila (the 5 Principles of Indonesia), Indonesian Language; Civics
- University-level compulsory subjects (UNG; 22 credits): Culture; English; Introduction to Education/Educational Profession; Learner Development; Introduction to School Environment 1 and 2 (internships); Leadership, Entrepreneurship; Student Community Service

In addition to the catalogue of national-level and university-level compulsory subjects, the curriculum of Bachelor of Biology Education consists of:

- Department-/study programme-level compulsory subjects (DAA/DAG; 92 credits): Calculus; General Biology; Basic Chemistry; Basic Physics; Science Philosophy; Laboratory Technique; Biochemistry; Cell Biology; Animal Structure and Development 1; Plant Structure and Development 1; Plant Diversity I; Animal Diversity I; Ecology; Local Wisdom Literacy; Edu-Tourism; Ethnoscience; Genetics 1; Animal Structure and Development 2; Plant Structure and Development 2; Plant Diversity II; Animal Diversity II; Professional for Teacher Development; Evolution, Microbiology; Genetics II; Human Anatomy and Physiology; Animal Physiology; Plant Physiology; Biology Learning and Instruction; Research Methodology; Biotechnology; Biostatistics; Media Production; Teaching Material Development; Instructional Curriculum; Instructional Strategies; Instructional Evaluation; Instructional Design; Bachelor Thesis.
- Electives (minimum 22 credits) from the following modules: Innovative Learning, Natural Resources Conservation, Occupational Health and Safety (K3), Corps, Ichthyology, Entomology, Mycology, Bacteriology, Applied Microbiology, Plant Tissue Culture, Laboratory Management, Toxicology, Food Preservation Technology, Public Speaking, Digital Marketing, Development of School Biology Practicum, Endocrinology, Lesson Study, Ethnobotany, Qualitative Research Method, Nutrition and health, Ethology, Environmental impact assessment, Population Genetics, Reproduction, Parasitology, HOTS in Biology Learning.

In addition to the catalogue of national-level and university-level compulsory subjects, the curriculum of Bachelor of Chemistry Education consists of:



- Department/study programme-level compulsory subjects (DAA/DAJ; 104 credits): Calculus; General Biology; Basic Physics; Basic Chemistry 1 and 2; Basic Chemistry Lab 1 and 2; Inorganic Chemistry 1, 2 and 3; Inorganic Chemistry Lab; Analytical Chemistry; Organic Chemistry 1, 2 and 3; Organic Chemistry Lab 1 and 2; Physical Chemistry 1 and 2; Biochemistry 1 and 2; Separation Chemistry; Radiochemistry; Statistics; Philosophy of Science; Instrument analytical; Learning and Instruction; Chemical Bonding; Research Methodology; Computational Chemistry; Waste Treatment; Culinary Chemistry; Chemistry of Energy; Chemistry of Natural Products; Lab Management; STEM Education; Capita Selecta Science; Technology and Media Educational Science; Overseas Teaching Field Experience; Chemistry Learning Strategy; Learning Assessment; Study of Curriculum and Chemistry Textbooks; Problems in Teaching Chemistry; Plan in Learning Chemistry
- Electives (minimum twelve credits) from the following modules: Chemistry for Vocational High School; Chemistry for High School; Introduction to Biotechnology; Toxicological Chemistry; Innovative Chemistry Learning; Technology and Informatics in Chemistry Learning; Development of Learning Media based on Local Wisdom; Development of Chemistry teaching material for Senior High School; Environmental Chemistry; Food Chemistry

In addition to the catalogue of national-level and university-level compulsory subjects, the curriculum of Bachelor of Physics Education consists of:

- Department/study programme-level compulsory subjects (DAA/DAE; 102 credits): Calculus I and II; General Biology; Basic Physics 1 and 2 ; Basic Chemistry; Practical of Basic Physics 1 and 2; Mechanics, Basic Statistics; Basic Electronics; Philosophy of Science; Mathematics Physics 1 and 2; Physics Laboratory; Modern Physics Thermodynamics; Waves and Optics; Magnetic Electric; Capita Selecta School Physics; Physics Learning Research; Physics Education Profession; Quantum Physics; Multimedia; Statistical Physics; Introduction Core Physics; Introduction Solid Physics; Physics Learning Assessment; Physics Learning and Instruction; Physics Learning and Teaching Interaction; Physics Lesson Planning; Study Physics Curriculum and Textbook; Physics Management Tools; School Physics Laboratory Management
- Electives (minimum twelve credits) from the following modules: Capita Selecta Science I; Matrix and Vector Space (both semester 3 electives); Capita Selecta Science II; Learning Physics for Children with Special Needs (both semester 4 electives) Algorithms and Programming; Astrophysics; Biophysics; Advanced Electronics; Physiography; Marine Physics; Environmental Physics; Soil Physics (semester 5 electives); Energy Physics; Material Physics; Learning Disaster Emergency Schools; Classroom Action Research; Development of Physics Learning Devices; Physics Seminar (semester 6 electives)

In addition to the catalogue of national-level and university-level compulsory subjects, the curriculum of Bachelor of Geography Education consists of:

- Department/study programme-level compulsory subjects (DAA/DAL; 106 credits): Calculus; General Biology; Basic Physics; Basic Chemistry; Introduction to Geography; General Geology; General Geomorphology; Learning and Instruction; Philosophy of Science; Basic Statistics; Meteorology and Climatology; Soil Geography; Hydrology; Population Geography and Demographics; Geographical Research Methods; Agricultural Geography; Indonesian

Geology and Geomorphology; Cartography; Urban Village Geography; Geography of Natural Resources; Transportation Geography; Geography Learning Strategy; Geography Learning Assessment; Geography Learning Planning; Economic Geography; Scientific Writing; Geography Information Systems; Remote Sensing; Regional Geography of Indonesia; Environmental Geography; Oceanography; Disaster Geography; Socio-Cultural Geography; Land Conservation and Reclamation; Biogeography; Study of Curriculum and Textbook; Geography Learning Media; Education Management; Development of Teaching Materials; Learning Technologies; Classroom Action Research; Environmental Impact Assessment; Field Work Practice; Geography of Development and Regional Planning

- Electives (minimum eight credits) from the following modules: Mineralogy and Petrology; Industrial Geography; Tourism Geography; Digital Image Processing; Anthropology; Cosmography; Thematic Cartography; World Regional Geography; Land Resource Evaluation; Political Geography; Applied Geographic Information System; Problem Based Learning; Environmental Modeling; Hydrogeology

### Rationale for degree and programme name

The study programme names refer to the Regulation of the Ministry of Research, Technology and Higher Education Number 33 of 2018 about the study programmes names in Higher Education and the Decree of the establishment of each study programme (Table 8).

**Table 8: Name and degree of study programmes at UNG’s Faculty of Mathematics and Natural Sciences**

| ProgrammeName       |                     | Graduate Degree |                       |
|---------------------|---------------------|-----------------|-----------------------|
| Indonesian Name     | English Name        | Indonesian Name | English Name          |
| Pendidikan Biologi  | Biology Education   | S.Pd            | Bachelor of education |
| Pendidikan Kimia    | Chemistry Education | S.Pd            | Bachelor of education |
| Pendidikan Geografi | Geography Education | S.Pd            | Bachelor of education |
| Pendidikan Fisika   | Physics Education   | S.Pd            | Bachelor of education |

### Intergration of Theory and Practice

The learning process in all study programmes is designed in theory, practicum, case studies and project-based learning. In general, the proportion is 40 % theory, 20 % practicum, 20 % case study and 20 % project-based learning.

Integration between theory and practice in learning is carried out in the form of activities:

#### a. Laboratory practice

Laboratory practice is an activity that requires students to conduct experiments with the aid techniques to be learned in the study programme, to observe, to document, to analyse and to conclude. The percentage of modules relating to laboratory practical education in the Biology

Study Programme is 31.25 %, Chemistry is 29.23 %, Geography is 22.92 %, and Physics is 33.85 %.

b. Internship at school (PLP 1 and PLP 2, six credits)

Internship at school (PLP, Introduction to School Environment) is a process of observation and internship conducted by students to study aspects of learning and management of education in education units. PLP is a programme that requires integrated and applicable skills from all previous learning experiences. An internship is a training programme that includes performance in all matters relating to teaching activities and other teacher duties.

PLP 1 activities are held in the form of school observations and microteaching under the guidance of lecturers. PLP 2 activities are in the form of limited training activities, guided training, and reflective actions under the guidance of supervising lecturers and tutor teachers. PLP 1 and PLP 2 activities are aimed at achieving the pedagogic competence of graduates.

c. Field study

Field studies are visits to selected outside campus environments, relevant for supplementing and complementing information from theoretical studies for putting selected topics into a broader context. The locations of the natural laboratories for the implementation of field studies are the Bompon Magelang watershed, Bongo Tourism Village, Molotabu Tourism Village, Lonuo Village (Geography Education Study Programme), Torosiaje Serumpun, Bulalo Mangrove Forest, Panua Nature Reserve, Bogani Nani Wartabone National Park, MPR Nature Reserve (Biology Education Study Programme), Pangi Village Natural Laboratory, Leato Village and Lonuo Village (Chemistry Education Study Programme), Lopo Village Nature Laboratory (Physics Education Study Programme).

d. Independent learning-campus programme (MBKM, see above)

For all study programmes, Minister of Education and Culture Regulation Number 3 of 2020 gives students the right to study outside their study programme. This regulation is elaborated through the UNG Chancellor's Regulation Number 8 of 2021 concerning the independent learning-independent campus (MBKM) collaboration. Through this programme, there are wide opportunities for students to enrich and improve their competencies according to their interests. MBKM activities allow students to study with partner institutions both domestically and abroad. Learning outcomes with partner institutions will be converted to existing courses. MBKM activities can be student exchanges between study programmes within UNG, student exchanges between universities, work internships, teaching in schools, research, humanitarian projects, entrepreneurship, independent projects, and village building activities.

e. Student Community Service (KKN, 4 credits)

Student Community Service (KKN) is a form of community service activity by students with a cross-scientific and sectoral approach at certain times and areas. The Community Service Programme is carried out in the seventh semester and its implementation is coordinated by the UNG Research and Community Service Institute. In the KKN programme, students will work together with other study programmes to solve problems in the village where the KKN is located.

f. Bachelor Thesis

In Bachelor Theses, students are trained to conduct research and to solve a particular problem in the field of education, according to the selected study programme. Research topics for these

relate to developing material and media for improving learning methods at secondary schools, and proposing new learning models and topics associated with the scientific aspect of a given study programme with the aim to further develop additional and novel teaching material.

- g. Lecturers integrate their experiences as assessors for school accreditation, companions in teacher meetings (MGMP) or industry consultants into modules such as Teaching Planning, Teaching and Learning Strategies, Curriculum Studies and Textbooks.

Lecturers from industry act as consultants, for example in fields of environmental studies, chemistry, and geographical charting and mapping, for respective colleagues from academia.

### Interdisciplinary thinking

According to the self-evaluation report (page 23), interdisciplinary thinking is an important aspect that aims at broadening and widening students' knowledge in various fields of science, developing apart from the main scheme of a curriculum. Interdisciplinary thinking also aims at giving students insight into problem-solving strategies, methods of critical thinking, skills of writing scientific articles, leadership qualities, communication skills and self-responsibility.

In terms of Interdisciplinary thinking, interdisciplinary modules consist of Public Speaking, Digital Marketing, Culture, Local wisdom literacy (Biology Education), STEM Education and Waste Treatment (Chemistry Education), Environmental Impact Assessment (EIA), Anthropology, Petrology Mineralogy (Geography Education), Learning in Disaster Emergency School and Physics Learning for Students with Special Needs (Physics Education).

In terms of interdisciplinary thinking, the HEI also cites the Independent Learning-Campus Programme (MBKM), which gives students the opportunity to study outside the study programmes' curricula.

### Ethical aspects

Ethical aspects are contained in the academic programme as they are an integral part of the basic qualifications of the study programme. In some modules, the ethical aspects are the subject of the module content, such as Civics, Pancasila, and Religion. Issues specifically related to ethical aspects are also embedded into the curriculum through modules like Educational Profession and Teacher Profession. Students are taught the ethics of becoming professional in those related subjects. In Research Methodology and when writing their theses, students are required to use the knowledge imparted on ethics in citing other scholars' arguments and how to avoid plagiarism. In Translation and Interpreting, the aspect of ethics is integrated with learning ethical principles of being either translators or interpreters, as well as how to translate or interpret faithfully.

Academic ethics related to preventing plagiarism is part of nearly all modules. Prevention of plagiarism is particularly emphasised in modules associated with research methodology and scientific writing.

### Methods and scientific practice

Students learn skills and scientific methods relevant for a study programme in laboratory practical courses and fieldworks:

a. Laboratory practice.

Laboratory practice activities are carried out in the laboratory. Scientific practices that are trained through practical activities in the laboratory are analysing problems, collecting information (data), formulating hypotheses, analysing data, concluding, and writing practicum reports. The students are trained to think scientifically. Laboratory practice takes place from the first to the fifth semester.

b. Fieldwork.

Fieldwork is a form of scientific practice that aims to analyse problems, collect information (data), formulate hypotheses, evaluate data, draw conclusions, and compile reports on objects outside the classroom. The modules that apply the fieldwork lecture method take place from the second to the fifth semester.

c. Case study and project-based learning (PjBL)

There are several modules that have applied the case study method and project-based learning. In this learning, students are trained to solve problems related to the module. The steps in project-based learning are starting with making related questions about the assignments that will be carried out by students, taking topics according to reality and starting with an in-depth investigation. Students try to make the topics raised relevant to the characteristics of students. PjBL planning is carried out collaboratively between lecturers and students. Students and lecturers prepare a schedule for project completion. Lecturers monitor student activities in project completion. The lecturer conducts an assessment in the form of evaluating the progress of each student in completing the project and providing feedback on the results that have been achieved by students. Reflect on the results of the project work. The courses that apply the PjBL method take place from the third to the sixth semester.

d. Essay.

The resulting thesis trains students to applying expertise for solving problems in the field of education and teaching. In preparing and writing their thesis, students apply the scientific method in conducting research.

### Examination and final thesis

The assessment is carried out to measure the achievement of the CLO and ILO which are charged to the courses which consist of:

1. Assessment Techniques

Assessment techniques consist of observation and participation (activity in learning and creative problem solving), performance, tests, and oral tests. Attitude assessment uses observational assessment techniques. Assessment of mastery of knowledge, general skills, and

specific skills is carried out by selecting one or a combination of various assessment techniques and instruments.

## 2. Assessment Instruments

The assessment instruments consist of a process assessment in the form of a rubric and/or a result assessment in the form of a portfolio or design work. The test instrument can be in the form of an objective test, an essay test, or an assessment of PjBL performance reports.

## 3. Assessment Form (Mid test, Final Test, Participation, assignment)

Examination in each course is carried out periodically through Mid test and Final tests. The examination schedule is determined by the University through the Academic Calendar. The form of an exam varies according to contents and learning objectives. Marks of assessment reports, expressed in terms of students' success by percentages of a maximum score are listed in the following table:

**Table 9: Assessment criteria**

| Interval Percentage Level of Mastery/Ability/Performance | Symbol | Score | Information |
|--|--------|-------|-------------|
| 90 – 100   | A      | 4     | Passed      |
| 85 - 89  | A-     | 3.70  | Passed      |
| 80 - 84  | B+     | 3.30  | Passed      |
| 75 - 79  | B      | 3.00  | Passed      |
| 70 - 74  | B-     | 2.70  | Passed      |
| 65 - 69  | C+     | 2.30  | Passed      |
| 55 - 64  | C      | 2.00  | Passed      |
| 50 - 54  | D      | 1.00  | Failed      |
| < 50   | E      | 0     | Failed      |

Source: Rector regulation No. 2/2020 about academic guideline

Assessment aspects include participation (10 %), assignments (20 %), Mid test (30 %), and Final test (40 %). Assessment criteria are communicated to new students during campus introduction activities and can be accessed through the Learning Management Platform <https://siat.ung.ac.id>.

Bachelor theses (12 SKS credits) are assessed by evaluating research proposals, seminars on research results and thesis examinations. Proposals are assessed by taking presentation techniques, quality of answers, depth of theory, originality, and research methods into account. Theses exams are assessed by considering ability of a student to explain, to reason and to analyse, by taking competences into account, such as the depth of content, explanation, knowledge, and research methodology, by didactics, particularly the ability to explain research results in teaching style, and by originality of content. The bachelor thesis is examined by a commission consisting of three examiners and two supervisors who have the field of expertise according to the bachelor thesis. In addition, students are required to publish their research in scientific journals to improve students writing skills. The characteristic of scientific journals that publish bachelor theses are accredited by the Ministry of Education, Culture, Research, and Technology in the Science and Technology Index (Sinta).

The assessment guidelines are regulated through the Academic Guidelines stipulated by the UNG Rector's regulation no. 2 of 2020 concerning Academic Regulations.

## Appraisal:

The curricula adequately reflect the qualification objectives of the study programmes. The contents of the modules are well-balanced, logically connected and oriented towards the intended learning outcomes. The areas of optional electives enable students to acquire additional competences and skills. During the assessment conference the panel learned that students would appreciate gaining deeper knowledge in English language from appropriate modules in their curricula. The panel therefore recommends strengthening the role of English as language of science, for example by adding additional and more specific English courses into the curriculum and/or teaching more courses in English. As for the Bachelor of Biology Education study programme, in the panel's opinion practical teaching components should be increased. A good combination of theoretical content and related practical elements enable students to plan, implement and analyse lessons in a more elaborate and differentiated manner. The practical phases should help students to orientate themselves in their professional field and to expand their competences. At the beginning of their studies students should observe lessons in their early practical phases. They might examine their own image of teachers and ask themselves whether they are aiming for a profession that is suitable for them. In higher semesters, school practice could be used for academic training, for example in the context of "research-based learning". Furthermore, the practical phases in higher semester also offer an opportunity to prepare for teaching and to test and reflect on theoretically acquired knowledge in practice. At this point, however, it should be explicitly pointed out that empirical studies on teacher training show that simply extending practical phases does not necessarily lead to additional competence acquisition among student teachers. The concrete design and quality of the practical learning opportunities are crucial. The panel therefore recommends integrating additional practical teaching components within relevant modules, and also within the curriculum.

The degrees and programme names of all four programmes correspond to the contents of the curriculum and the programme objectives. The panel acknowledges that there is a national regulation for the naming of study programmes in Indonesia by the Indonesian Ministry of Research, Technology and Higher Education.

Theoretical questions are, where possible, explained by means of practical examples. This aspect was convincingly presented to the panel during the assessment conference by lecturers and students as well as during the presentation of the laboratory equipment. For instance, in the Bachelor of Physics education the proportion of practical work is 30 %.

All study programmes include aspects of motivating and qualifying for interdisciplinary thinking. The panel learned during the assessment conference that the curricula follow the principle of education in three steps: Basic principles, methods, interdisciplinary education. To further refining this concept, the panel recommends reviewing the curriculum of the Bachelor of Chemistry Education, adhering at the moment to an established traditional concept based on ideas of aromaticity, the idea of name-reactions, isolated events of addition, substitution, and elimination, rather of a timely intermedidate-based unified reaction theory. Also the panel had the impression that the time to be right for substituting concepts of key performance indicators for judging sustainability of transformations for the logic of green chemistry, which in many ways, has declined in significance over the past decade. The panel furthermore encourages considering a curriculum as logic of modules rather than too fragmented individual learning units. Radiochemistry for

example has the potential to be included into science physics. Chemistry of, for instance, carbohydrates, lipids, amino acids, proteins is taught in Organic Chemistry 2, Biochemistry 1, Culinary Chemistry, and Food Chemistry, with the latter two, according to module descriptions, being identical. Summarising the four courses exemplified in the previous sentence into a larger unit, possibly coming closer to the original idea of a module, thus has the potential contributing to prevent doubling, tripling, and quadruplicating of contents from occurring. Other courses seem to stand alone, disallowing to uncover the essence of the topic in full detail, for example, by teaching Biotechnology without providing fundamentals of Chemical Technology.

Ethical implications are appropriately communicated in all four study programmes. Moreover, the identification and reflection of ethical aspects are strongly promoted and considered key competences and an integral part of the study programme's qualification objectives.

During the online assessment conference, the panel requested the University to provide lists of experiments that are conducted in laboratory practices in all study programmes. These lists helped to support the conclusion for the BCE, BPE and BGE programmes, that students acquire methodological competences and are enabled to do scientific work on the required level.

For the Bachelor of Geography Education, the panel notes that the curriculum adequately reflects teaching methods in physical geography, but does not reflect teaching methods in Human Geography. As Human Geography content is based on quantitative social empirical methods (for example, surveys) or qualitative methods (for example, interviews) and both methods are components for a practice-oriented teaching, the panel team views teaching methods in Human Geography as essential for a study programme in geography education.

In its statement, UNG argues that for the Bachelor of Geography Education, content of Human Geography has been covered in the curriculum, including courses: Geography of Population and Demography; Socio-Cultural Geography; Urban Village Geography; Economic Geography; Geography of Regional Planning and Development; Regional Geography of Indonesia; World Regional Geography.

According to UNG's statement, the course Geography of Population and Demographics is a study of the structure and processes of population events. In this course, students conduct mini survey activities to collect and analysis population data. The course Socio-Cultural Geography describes socio-cultural concepts, cultural diversity, social dynamics, social interaction, social activities of rural and urban communities, community organisational systems, social structures, social institutions, social change, and local wisdom. The course Geography of Rural and Urban works on the characteristics of villages and cities, classification, scope, typology of villages and urban classifications, spatial structure, problems faced, planning, and construction. The course Economic Geography discuss human economic activities in utilising resources and planning to meet their needs from a geographical point of view. The course Geography of Development and Regional Planning discusses the development planning system and the procedures for the preparation of the regional planning because basically regional planning is dynamic following development developments.

The Regional Geography of Indonesia course is designed to provide knowledge and understanding of Indonesian Regional Geography includes Indonesian population resources, Indonesia's economic conditions, Indonesian political situation, and Indonesian culture.



The World Regional Geography course discusses population, social, economic, cultural, and political conditions in of world continents.

In the opinion of the panel, the courses mentioned in UNG’s statement are content lessons. However, methods of Human Geography seem to be applied only in Geography of Population and Demographics. The panel did not see practical methodological content on Human geography in the lesson plans of the other courses mentioned. In order to qualify future teachers to design didactically sophisticated lessons and future planners to evaluate empirical reports, the panel recommends the following **condition** for the programme Bachelor of Geography Education:

The University includes teaching methods of Human Geography in the curriculum

All exams, as they are defined for the courses, are suited in format and content to ascertain the intended learning outcomes. The requirements are in accordance with the desired qualification level. The exams are characterised by a wide variety of test formats, although the panel had the impression that the method of oral examination seemed underrepresented compared to written exams. The panel therefore recommends implementing more oral examinations into the assessment catalogue. Furthermore, the panel welcomes the fact that assessment aspects include participation, assignments and written tests, but recommends being more flexible in weighting the assessment aspects and reviewing the assessment weighting for each course.

Final theses are evaluated based on previously published and coherently applied criteria, rules and procedures. The students prove, especially in their thesis, their ability to conduct scientific work and the achievement of the study programme’s qualification objectives.

|   | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|---|-------------|------------------------------|----------------------------|------------------------------------|------|
| 3.1 Contents  |             |                              |                            |                                    |      |
| 3.1.1* Logic and conceptual coherence (Asterisk Criterion)          |             |                              | X                          |                                    |      |
| 3.1.2* Rationale for degree and programme name (Asterisk Criterion) |             |                              | X                          |                                    |      |
| 3.1.3* Integration of theory and practice (Asterisk Criterion)      |             |                              | X                          |                                    |      |
| 3.1.4 Interdisciplinary thinking                                    |             |                              | X                          |                                    |      |
| 3.1.5 Ethical aspects   |             | X                            |                            |                                    |      |
| 3.1.6* Methods and scientific practice (Asterisk Criterion)         |             |                              | BBE<br>BCE<br>BPE          | BGE:<br>condition                  |      |
| 3.1.7* Examination and final thesis (Asterisk Criterion)            |             |                              | X                          |                                    |      |

## 3.2 Structure

### Modular structure of the study programmes

The student’s learning progress in all study programmes is measured using the Indonesian credit system (satuan kredit semester (SKS) or semester credit unit). One SKS credit equals 170 minutes of activities per week, which are comprised of 50 minutes in-class activities (“learning process

activities“), 60 minutes structured academic activities (“structured assignment activities”) and 60 minutes self-study activities (“independent activities”). There are 14 weeks of learning activities in one semester. One SKS credit amounts to 2,380 minutes/39.66 hours (170 minutes x 14 weeks)<sup>14</sup>. The maximum number of credits per semester is 22.

Since one ECTS credit equals 1,500 minutes/25 hours; 1 SKS credit equals 1.5867 ECTS credits or roughly 1.6. The programmes require students to acquire a minimum of 230.4 ECTS credits (144 SKS credits) respectively 233.6 ECTS credits (146 SKS credits, Chemistry Education) to complete the programme. With the maximum study load of 35 ECTS credits (22 SKS credits) for each semester, students are expected to finish the programme within seven to eight semesters and no longer than 14 semesters. All modules (courses in UNG’s terminology) are weighted 1.6 - 6.4 ECTS (1-4 SKS credits).

|  | Biology Education  | Chemistry Education                 | Geography Education                 | Physics Education                    |
|--|--|-------------------------------------|-------------------------------------|--------------------------------------|
| Projected study time   | 4 years  |                                     |                                     |                                      |
| Number of Credit Points (CP)                                 | 144 CP equals to 230,4 ECTS<br>146 CP equals to 233,6 ECTS (Chemistry Education) |                                     |                                     |                                      |
| Workload per CP  | 1 unit = 39.66 hours<br>1 ECTS = 25 hours  |                                     |                                     |                                      |
| Number of courses  | 53 Compulsory<br>11 Elective Courses   | 60 Compulsory<br>4 Elective Courses | 58 Compulsory<br>4 Elective Courses | 47 Compulsory<br>18 Elective Courses |
| Time required for processing the final thesis and awarded CP | 1 Semester (6 SKS credits)   |                                     |                                     |                                      |
| Number of contact hours                                      | 5,712 hours  | 5,791 hours                         | 5,712 hours                         | 5,940 hours                          |

To earn the degree of Bachelor of education, students must earn a minimum of 144 (146 in Chemistry Education) SKS credits that can be completed in at least seven semesters. Students can take more electives based on their interests.

### Study and exam regulations

Study periods and assessments are regulated in the UNG Rector's Regulation No. 2 of 2020 concerning Academic Regulations Articles 38 – 46.

The study period for the implementation of the undergraduate education programme is a maximum of seven years (14 semesters).

Student study evaluation is an assessment of study results to determine the feasibility and abilities of students. The evaluation of the study is based on the Grade Point Average (GPA) and the number

---

<sup>14</sup> Academic Regulations of Universitas Negeri Gorontalo, Article 39

of credits taken at the time the evaluation was carried out. The study evaluation consists of Stage I Evaluation and Stage II Evaluation.

Stage I evaluation is a coaching phase to identify various obstacles in the learning process. It is carried out in the second semester, the minimum number of credits passed is 16 SKS credits with a GPA of 2.00.

Stage II evaluation is carried out in the fourth semester. At this stage students evaluated whether to continue their studies, based on a minimum number of credits 32 SKS credits, achieved with a minimum GPA of 2.50. In case of less credits and poorer performance at this stage, students are considered not qualified for completing their studies. Stage II evaluation thus is an option for terminating a study schedule.

Learning assessment standards are the minimum criteria referring to the assessment of student learning processes and outcomes in the context of compliance with the ILO. Undergraduate students pass assessment in case of completing all the learning loads set and met the ILO targeted by the study programme, without D and E grades, minimum GPA 2.00, have produced articles published in scientific journals, have taken the Indonesian Language Proficiency Test (UKBI) and have a minimum TOEFL score of 450. Final marks attainable for of students in graduation are Cum laude (GPA 3.5 – 4.00 and a maximum study period of 4 years, no C grade, no repetition of courses), Very satisfactory (GPA 3.01 – 3.50), Satisfactory (GPA 2.76 – 3.00). Students who are declared passed are entitled to obtain diplomas, degrees, supplementary diplomas (SKPI) and academic transcripts.

Academic regulations regarding the study period and examinations are communicated to students at the beginning of a semester. UNG's academic regulations can be accessed through UNG's website<sup>15</sup>. The Faculty's academic guidelines can be accessed via the faculty's website<sup>16</sup>.

#### Feasibility of study workload

Calculated workload per semester ranges between at least 16 and at maximum of 22 SKS credits (25.6 to 35.2 ECTS credits). Efforts made by the study programmes to ensure a timely study period (four years) are:

1. Lecturers allocate sufficient time for student consultation, if students experience difficulties in lectures.
2. Academic Advisors help students having learning difficulties. Advisors assist students in determining the study load in accordance with the study progress. The eligibility for student credits is determined based on the Grade point average (IPS). Students with GPA > 3.0 can take a study workload of 24 SKS credits. GPA 2.5 -3.0 can take a study workload of 20 SKS credits. GPA 2.0 - 2.49 can take a study workload of 16 SKS credits and GPA < 2.0 ca take a study workload of 13 SKS credits. If students take an average of 20 SKS credits per semester, then students can complete their studies on time (4 years).
3. Administrative support to assist students related to administrative matters as library access, or laboratory access.
4. Periodic evaluation of lecturers based on feedback from students. The evaluation results are

---

<sup>15</sup> <https://ung.ac.id>, last call October 20, 2022

<sup>16</sup> <https://fmipa.ung.ac.id>, last call October 20, 2022

used by lecturers, and by programme managers for improving quality.

5. The thesis supervisor assists in ensuring completion of a bachelor thesis on time.

### Equality of opportunity

In general, anti-discrimination is regulated in Law Number 40 of 2008 concerning the Elimination of Racial and Ethnic Discrimination. This regulation was followed up with Standard Norms and Regulation No. 1 on the Elimination of Racial and Ethnic Discrimination issued by the National Human Rights Commission.

Based on this, the State University of Gorontalo secures anti-discrimination policy by gender, religion, ethnicity, socia class and social status, and physical disability in providing educational services. Admission of students in study programmes occurs by strictly adhering to these regulation.

In lectures, the State University of Gorontalo does not differentiate students based on gender, ethnicity, marital status, economic class, religion and disability. Discrimination on any basis is not tolerated. The right to access facilities does not discriminate.

UNG has a policy to facilitate students with special needs. This refers to Government Regulation Number 13 of 2020 concerning adequate accommodation for students and persons with disabilities. In its implementation, UNG provides facilities for students with special needs, namely the provision of scholarships and access roads for the disabled. Methods of examination are adapted in case of disabilities to secure equal opportunities.

Scholarship services are supported by the central government (DIKTI) and universities. This service is provided by the Student Affairs Department of the Faculty of Mathematics and Natural Sciences (FMIPA) and the UNG Academic and Planning Bureau. Scholarship services include information on scholarship opportunities, requirements, and registration. Students can obtain scholarship information on the UNG Academic and Planning Bureau website (<http://bakp.ung.ac.id>) and SIAT UNG (<https://siat.ung.ac.id>). Types of scholarships and number of recipients within the four study programmes are presented in Table 10.

**Table 10: Types of Scholarships and Scholarship Recipients**

| Scholarship Type              | Study Program       |                   |                   |                     |
|-------------------------------|---------------------|-------------------|-------------------|---------------------|
|                               | Chemistry Education | Biology Education | Physics education | Geography Education |
| Bidik Misi Scholarship        | 0                   | 125               | 81                | 126                 |
| Unggulan scholarship          | 0                   | 0                 | 0                 | 1                   |
| BAZNAS Scholarship            | 0                   | 0                 | 0                 | 1                   |
| Bank Indonesia Scholarship    | 1                   | 0                 | 0                 | 2                   |
| Local Government Scholarships | 4                   | 0                 | 0                 | 0                   |
| PPA Scholarship               | 23                  | 0                 | 0                 | 0                   |

|   |    |     |    |     |
|---|----|-----|----|-----|
| UKT's Support Scholarship                 | 74 | 130 | 84 | 102 |
| ADIK Scholarship                          | 0  | 2   | 0  | 1   |
| YBM-BRI Smart Scholarships                | 0  | 0   | 0  | 3   |
| Scholarship - Van Deventer-Maas Indonesia | 0  | 0   | 0  | 2   |

## Appraisal:

The programme structure supports the smooth implementation of the curriculum and helps students to reach the defined learning outcomes. The programme consists of modules and assigns Credit-Points (CP) per module on the basis of the necessary student workload. Practical components are designed and integrated in such a way that CPs can be acquired.

According to the University, 1 SKS credit equals 40 hours and therefore corresponds with 1.6 ECTS credits.

The course descriptions (“lesson plans”) of all programmes provide most of the information defined in the ECTS Users’ Guide. However, the panel noted that the course descriptions included copy and paste information with respect to learning outcomes (ILO), assessment requirements and information on the language of instruction. The panel also noted that literature recommendations for the BCE and BGE programme need to be reviewed for securing concise and state-of-the-art information for students<sup>17</sup>.

The panel also noted missing module descriptions for the theses.

Most descriptions of chemistry modules furthermore lack information regarding teaching hours, the integration of ICT in teaching and learning, whether or not a course consists of lecture and exercise, how many hours of teaching and how many hours of exercise are offered, and, if more than one type of examination is offered, how the final the mark is obtained.

In its statement, UNG provided revised sample course descriptions (“lesson plans”) for all study programmes, updated literature recommendations for the BGE programme, semester lesson plans for the theses, and sample module descriptions for the BCE programme to prove that the chemistry department has implemented an oriented-based education curriculum that contains detailed teaching hours, the integration of ICT in teaching and learning, and exercise hours.

The panel acknowledges the effort of UNG in revising the sample lesson plans, the updated literature for the BGE programme and the lesson plans for the theses. The panel would like to

---

<sup>17</sup> BCE: Inorganic Chemistry courses, for example, rely on similar General Chemistry books as Organic Chemistry courses, recommending issues published from 1970ies until the 1990ies. Some books for other chemistry classes refer to issues published between 2000 until 2010, and less from 2011 until today. Also, the panel noted that module descriptions referring to laboratory courses never recommended handbooks/textbooks/instructing books for laboratory practical work. All recommendations for such courses quoted General Chemistry textbooks.

BGE: URBAN VILLAGE GEOGRAPHY; Clout, H.D. 1972. Rural Geography: An Introductory. London  
 ECONOMIC GEOGRAPHY; Alexander, Jhon W., (1963), Economic Geography, Prantice-Hall, Inc, New York.  
 Bale, (1977), Industry Geography. Boesch, Hans, (1964), A Geography of World Economy, D. Van Nostrand C., Inc., New York

emphasise that the revisions of the module descriptions point into the proper direction. However, the panel prefers to have a more comprehensive check of more module descriptions after revision.

The panel also acknowledges considerable effort in documenting teaching and examination for the sample modules in the BCE programme. However, for the BCE programme, the panel also notes that the information still could be more precisely stated (e.g. x hours teaching, y hours exercises and so on) and prefers to have a more comprehensive check of more module descriptions after revision.

As for the theses descriptions, the panel notes that the descriptions disclose numerous similarities to other module descriptions. The main focus of the theses descriptions should be on conducting guided research, analysing data, discussing data, learning about ethics in science, writing a scientific thesis related to teaching aspects and defending this theses. In the opinion of the panel the theses descriptions lack in specificity for documenting that the objective of the respective study programme is fulfilled. The panel also notes that a defence of the thesis is not stated in the module description.

Therefore, the panel recommends the following **condition** for all programmes:

The University completes the information in the Module handbooks regarding

- a) course specific intended learning outcomes (ILOs)
- b) specifying the course specific assessments
- c) specifying contents of lectures, seminars and practical classes in instances where mixed methods are documented (BCE)
- d) course descriptions for the theses
- e) updated literature (BCE and BGE)

There are legally binding study and exam regulations which contain all necessary rules and procedures and take into account the national requirements. The study programmes are designed so that students can study for a certain time at other HEIs or do internships without any extension of their overall study time. The Republic of Indonesia has not ratified the Lisbon Recognition Convention.<sup>18</sup> In its statement, UNG provided the decree of the Rector of Universitas Negeri Gorontalo Number concerning Guidelines for the Equivalence of Activities Independent Campus, Freedom to Learn (MBKM) Universitas Negeri Gorontalo (see Chapter 3.1). But the panel also recommends the University stipulating the recognition of periods of study at HEIs outside the MBKM programme and the transfer of obtained credits.

The University handed in Diploma Supplements for the study programmes which show the national education system, information about the national credit system (SKS) and its conversion to the European ECTS system as well as an ECTS grading table.

The feasibility of the study programme's workload is ensured by a suitable curriculum design, by a plausible calculation of workload, by an adequate number and frequency of examinations, by appropriate support services as well as academic and general student counselling. When reviewing the workload, the University also takes into account evaluation findings and the programme's success rate. For the necessity of evaluating course workloads, see condition chapter 5.

UNG ensures gender equality and non-discrimination. Students with disabilities are provided with affirmative actions concerning time and formal requirements throughout the programme and

---

<sup>18</sup> <https://www.coe.int/en/web/conventions/full-list?module=signatures-by-treaty&treatynum=165>

examinations. Students in special circumstances, such as single parents, foreign students, students with a migration background and/or from so-called non-academic backgrounds, are particularly assisted. During the assessment conference the panel learned that equality of opportunity is one of eight performance indicators for public universities in Indonesia.

|        | Exceptional   | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|--------|---|------------------------------|----------------------------|------------------------------------|------|
| 3.2    | Structure   |                              |                            |                                    |      |
| 3.2.1* | Modular structure of the study programme (Asterisk Criterion) |                              | condition                  |                                    |      |
| 3.2.2* | Study and exam regulations (Asterisk Criterion)               |                              | X                          |                                    |      |
| 3.2.3* | Feasibility of study workload (Asterisk Criterion)            |                              | X                          |                                    |      |
| 3.2.4  | Equality of opportunity                                       |                              | X                          |                                    |      |

### 3.3. Didactical concept

Didactic concepts applied are for all four study programmes student-centred and involve collaborative learning. Each study programme applies a logical and rational didactic learning process. Student-centred learning is applied through the Project-Based Learning (PjBL) method, case studies, discussions, role play and laboratory practice.

Therefore, lecturers need to be skilled for mastering these learning models. Lecturers in the four study programmes improve their teaching skills through Training on Basic Skills Improvement in Instructional Techniques (PEKERTI) and Applied Approach (AA) for each lecturer (see chapter 4.1).

Improving students' didactic abilities is carried out through internships at school (PLP) which is carried out in two stages, namely PLP 1 and PLP 2.

Learning is carried out with synchronous learning and asynchronous learning approaches. The synchronous learning approach is implemented face-to-face (discussion, practice, workshop) and through e-learning. The asynchronous learning approach is applied independently (reading material, watching learning videos, simulations, instructions for learning laboratory practical methods) and collaboratively (online discussions, online assignments).

For the online learning process, UNG provides a learning platform<sup>19</sup>. Lecturers use the platform to disseminate course materials. Lecture materials are prepared by the teaching team at the beginning of the semester and are updated every year according to the need to achieve learning objectives. Lecture materials are in the form of textbooks, journal articles, PowerPoint presentations, learning modules, practical guides. Lecture materials are uploaded by every teaching team via the learning platform or can be obtained through the UNG library<sup>20</sup>. In blended learning lectures, lecture materials are supported by learning videos that can be accessed via the YouTube platform. Learning materials can also be designed in the form of problem-solving case studies.

<sup>19</sup> <https://siat.ung.ac.id>

<sup>20</sup> <https://perlibrary.ung.ac.id/>

In the implementation of academic freedom, study programmes can invite experts from outside the University to express their thoughts and opinions in accordance with scientific norms and rules (Rector's Regulation Number 2 of 2020, Article 56 paragraph 5). Activities involving guest lecturers are carried out through seminars and workshops aimed at sharing work experiences with students. Every year the University invites prominent people from various fields such as science, business, politics, government and other fields to give public lectures, guest lectures or expert lectures.

The Faculty of Mathematics and Natural Sciences (FMIPA) continues to collaborate with the industries and to bridge between universities and the business world. One form of implementation of the collaboration between the Faculty of Mathematics and Natural Sciences and the business is the implementation of lectures by practitioners.

**Table 11: Guest lecturers from practice at the Faculty of Mathematics and Natural Sciences**

| Study Programme     | Industry Lecturer | Field of work   | Scientific Relevance with Study Programmes |
|---------------------|-------------------|---|--|
| Chemistry Education | Guest Lecturer 1  | Head of Division<br>PP-P2 Chemistry<br>Indonesian Institute of<br>Sciences              | Organic Chemistry II                       |
|                     | Guest Lecturer 2  | IMB-University<br>Malaysia researcher<br>Trengganu                                      | Biochemistry<br>Biotechnology              |
|                     | Guest Lecturer 3  | Expert Staff of PT.<br>Alpha Science  | Chromatography                             |
| Biology Education   | Guest Lecturer 1  | Head of Gorontalo<br>Province Assessment<br>Institute for<br>Agricultural<br>Technology | Biotechnology                              |
|                     | Guest Lecturer 2  | Pertamina Foundation  | Enviromental Science                       |
| Physics education   | Guest Lecturer 1  | Head of Research<br>Group of Laser,<br>Indonesian Institute of<br>Sciences              | Algorithms and<br>Programming              |
|                     | Guest Lecturer 2  | System Engineer NTT<br>Ltd Japan  | Advanced Electronic                        |
|                     | Guest Lecturer 3  | Co-Founder CV. Mantis<br>Indonesia  | Multimedia                                 |
|                     | Guest Lecturer 4  | Gorontalo's<br>Educational Quality<br>Assurance Council                                 | Education and Learning                     |
| Geography Education | Guest Lecturer 1  | Chairman of Indonesia<br>Association of<br>Indonesian Geospatial<br>Information Experts | World Regional<br>Geography                |
|                     | Guest Lecturer 2  | Head of Course and<br>Training Institute<br>Geospatial Bumi<br>Nusantara                | Geographic Information<br>System           |



Lecturing tutors are an integral part of the learning process in the programmes. There are lecturing tutor activities carried out by senior students in providing guidance to junior students. Students assist lecturers in guiding and mentoring entry-level students. Tutoring is carried out in the following ways:

- a. Laboratory assistants help guiding students to carry out practical work both in the laboratory and in the field. The laboratory assistant's duties are coaching students before practice, conducting pre-test preparation and post-test follow-up, guiding students in operating the equipment and guiding students in compiling laboratory practice reports.
- b. Peer tutors are senior students that assist junior students in setting up and implementing study plans, guide students in finding references for scientific publications and in writing scientific papers, and assist students in solving problems in certain courses.

## Appraisal:

During the assessment conference the programme directors and lecturers presented a plausible didactic concept oriented towards fulfilling major programme objectives. The concept allows for the application of different teaching and learning methods, such as, for instance, case studies or practical projects. Students are encouraged to take an active role in creating the learning process and are supported by qualified and engaged lecturers (see chapter 4.1). However, the panel could not recognise the details of the didactical concept from the written documentation. The panel considers regular, comprehensive and integrated adaption of the didactical principles essential and therefore recommends compiling a comprehensive didactical concept which is also reflected in the course descriptions (see also condition in chapter 3.2 on completing information in the Module handbooks).

The accompanying course materials are oriented towards the intended learning outcomes and correspond to the required qualification level. The materials are user-friendly and encourage students to engage in further independent studies. However, for the BPE programme the panel noted that the integration of NOS (nature of science) and philosophy of science aspects into the course materials would be desirable. Currently these aspects are kept separately although the literature suggests that especially for NOS the integration is needed to reach success in learning. Therefore the panel recommends updating the course materials for the BPE programme by integrating aspects of Nature of Science as well as of Philosophy of Science (see also recommendation for all programmes in chapter 3.6).

Guest lecturers are invited and contribute to the students' qualification process with their special experience, either from professional practice or scientific work, but also, for example, from culture and politics. Lecturing tutors support the students in the learning process and help them develop competences and skills.

|        | Exceptional   | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|--------|---|------------------------------|----------------------------|------------------------------------|------|
| 3.3    | Didactical concept  |                              |                            |                                    |      |
| 3.3.1* | Logic and plausibility of the didactical concept (Asterisk Criterion) |                              | X                          |                                    |      |
| 3.3.2* | Course materials (Asterisk Criterion)                                 |                              | X                          |                                    |      |
| 3.3.3  | Guest lecturers   |                              | X                          |                                    |      |
| 3.3.4  | Lecturing tutors  |                              | X                          |                                    |      |

### 3.4 Internationality

Many courses in the study programmes have been designed to encourage students observing science phenomena not only on a local level or a focus on aspects of primarily important to Indonesia, but also at the international level. Students are expected to develop this multi-perspective approach on science inside and outside Indonesia in the course of the study programme. Focused on case-based learning, lecturers are encouraged to balance the course materials across local, national, and global contexts. According to the self-evaluation report (page 28), several courses are designed to enhance students' intercultural skills. Although most courses still are taught in Indonesian, materials frequently are provided in English.

Until now, there are no foreign students in the Faculty of Mathematics and Natural Sciences (FMIPA). Efforts have been made to recruit foreign students, namely by issuing Rector regulations regarding foreign student admissions, promoting study programmes through websites and education expositions in foreign countries, promoting study programmes through the University Bureau for International Cooperation and Services and through international accreditation of study programmes. These efforts have only been carried out in early 2021 but were until today not successful, presumably due the corona pandemy, which has appeared simultaneously.

Guidelines for admitting foreign students are regulated in the Rector's Decree Number 04/UN47/PD/2022 concerning UNG's New Student Admissions. Admission of foreign national students is carried out through self-selection and fulfils the administrative requirements that have been stated. Accepted foreign students are obliged improve Indonesian language skills to a level allowing them to progress in courses with similar rate than native speakers (see chapter 2.1).

Internationality of study programmes is furthermore supported by faculty staff having received in most instances parts of professional training in foreign countries. The study programmes do not yet have full-time foreign lecturers. Currently each study programme has one part-time foreign lecturer in the study programme, one from Government College University Faisalabad in Pakistan (Biology Education), one from Malaya University in Malaysia (Chemistry Education) and one from EHIME University, Japan in Geography Education. In Physics Education, the part-time lecturer is a practitioner from NTT, Japan.

The benefits that students get from having foreign lecturers are the establishment of research collaborations. Efforts made by faculties in involving foreign lecturers are by optimising the

implementation of foreign collaborations, overseas research collaborations, guest lecturers from foreign universities.

In supporting internationality, lectures and seminars in each study programme integrate English usage by using teaching material in English. The proportion of lectures in English in each study programme is an average of 38 %.

## Appraisal:

International contents are an integral part of the curricula of three study programmes (Bachelor of Chemistry Education, Bachelor of Physics Education and Bachelor of Geography Education). Students are thus prepared for the challenges in an international working environment. Through practical examples, students are enabled to act in an intercultural environment. As international content was not clear to the panel from the written documentation, the panel recommends presenting the existing international content more clearly on an operational basis, e.g. by describing the implementation of international aspects and the frequent use of international case studies in the course descriptions.

For the Bachelor of Biology Education, during the online assessment conference, the panel missed “Education for the Sustainable Development” as a necessary international component in the curriculum. In its statement, UNG provided material to prove that content of education for sustainable development has been included in the BBE programme's curriculum, namely in courses like Ecotourism; Health and Nutrition; Environmental Science; Learning and Instruction; and Culture.

The panel recommends including components of Education for Sustainable Development as an international component in the curriculum of the other three programmes.

Due to the programmes' objectives, an international composition of the student body may not be a priority. Nevertheless, international students may be regarded an enriching element for the study programme, when being able to interact with Indonesian students, society, and culture. First measures taken by the study programmes to promote internationality, so far, have to await international students to enroll. In order to increase the number of foreign students in all four programmes, the panel recommends establishing exchange programmes on a regular basis, and in order to facilitate contacts and to support the vision (see chapter Information on the Institution) the panel suggests to do so with a focus on neighbouring countries in South East Asia. The panel also recommends opening international classes (a specific track within the study programmes) or/and double degree programmes.

The international qualification of the faculty appropriately promotes the acquisition of international competences and skills. The measures taken are goal-oriented. In order to increase the international background of the faculty, the panel recommends focusing on acquiring part-time lecturers from neighbouring countries and invite guest lecturers from abroad on a regular basis.

The proportion of foreign language courses and required foreign language materials corresponds with the qualification objectives of the study programme. English literature is recommended in the course descriptions. However, during discussions with teachers and students during the assessment conference, the panel was not entirely convinced that working with the English literature is always an integral part of the courses. It remained unclear to the panel to what extent the

recommendations are followed by students. Therefore, the panel recommends developing ideas of integrated usage of English literature in the courses.

|        | Exceptional   | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|--------|---|------------------------------|----------------------------|------------------------------------|------|
| 3.4    | Internationality  |                              |                            |                                    |      |
| 3.4.1* | International contents and intercultural aspects (Asterisk Criterion) |                              |                            | X                                  |      |
| 3.4.2  | Internationality of the student body                                  |                              |                            | X                                  |      |
| 3.4.3  | Internationality of faculty   |                              |                            | X                                  |      |
| 3.4.4  | Foreign language contents   |                              |                            | X                                  |      |

### 3.5 Multidisciplinary competences and skills (Asterisk Criterion)

To improve students' multidisciplinary competencies and skills, several activities are implemented into the curricula: To improve written communication skills, students are given the task of writing scientific articles in several courses. Mandatory English courses help to improve oral communication skills. Oral communication, teamwork and leadership skills are also trained by means of small group discussions, case studies and project-based learning. Furthermore, student community service requires students from various study programmes to work in teams for strengthening multidisciplinary competences.

Universitas Negeri Gorontalo also offers a variety of extra-curricular activities and programmes for the students to improve and train their communication, leadership and teamwork skills: Students may attend national and international seminars, take part in the English debate competition (NUDC) or the Indonesian Language Debate Competition (KDMI), or take part in scientific writing competitions (PHP2D, SPEKMA, TALENT, PKM). Biology students can also take public speaking lectures.

Leadership courses are offered to build student leadership characters and confidence and to shape student organisational experiences. Leadership Training is conducted by the Student Executive Board (BEM), Department Student Association (HMJ) and Study Programme Student Association (HMPS).

#### Appraisal:

Students acquire communication and public-speaking skills as well as cooperation and conflict handling skills, as outlined in course descriptions. Developing these skills is supported by means of suitable didactical and methodological measures. Acquisition of further multidisciplinary competences, such as leadership skills and broad contextual knowledge, is ensured. During the interviews in the assessment conference the panel learned that in several courses workshops are utilised to foster teamwork. The panel recommends elaborating in more concise manner benefits from seminars and workshops for acquiring competences in specific modules, and outlining such competences specifically in module descriptions (see also condition in chapter 3.2 and recommendations in chapters 3.2, 3.3 and 3.4).

|      |   | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|------|---|-------------|------------------------------|----------------------------|------------------------------------|------|
| 3.5* | Multidisciplinary competences and skills (Asterisk Criterion) |             |                              | X                          |                                    |      |

### 3.6 Skills for employment / Employability (Asterisk Criterion)

The study programmes aim to design curricula according to the needs of the job market. Furthermore, the Career Development Center (CDC) offers four fields of activity to improve the students' career perspectives and support the employability of graduates: career development, student entrepreneurship development, student creativity and alumni activities.

In the field of student career development, CDC informs students and graduates about job opportunities, e.g. via (i) job information, (ii) job fairs, (iii) career planning information, and (iv) job placement services.

Improvement of student soft skills is carried out through leadership training, organisation, achievement motivation and entrepreneurship (entrepreneur) seminars. Entrepreneurship seminars include entrepreneurs from Indonesia, e.g. Rahmat Gobel (2018), Erwin Aksa (2017) and Sandiaga Uno (2019). The seminars aim to motivate students and graduates to become entrepreneurs. The University continues to monitor alumni careers through tracer studies by the quality assurance unit.

The results of the tracer study<sup>21</sup> show that skills considered important for finding work for graduates primarily refer to ethics, teamwork, self-development, mastery of information technology and expertise based on the field of science.

#### Appraisal:

Promotion of employability runs as a common thread of the study programme through all its modules. With two teaching internships and the extra-curricular MBKM programme, the study programmes do offer opportunities for practical training. However, due to the voluntariness of the MBKM programme and the limitation of the internships to six SKS credits of school teaching activities, the panel recommends integrating more opportunities or incentives for school- as well as out of school-internships in the curriculum. The panel also noted that the micro-teaching rooms do not offer access to lab equipment. To further increase the linking between teaching practice and laboratory practice, the panel therefore recommends implementing options for performing experimental lab simulations in the microteaching rooms, taking into account necessary standards (see also condition in chapter 4.4). And to prepare graduates for the discussions on the nature of science and better acceptance and understanding, the panel recommends integrating philosophy

<sup>21</sup> Study tracer results: <https://tracerstudy.ung.ac.id>, last call October 20, 2022

of science not only as a separate course, but also making the philosophy of science and the discussion on the nature of science an integral part of the curricula.

|      |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|------|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 3.6* | Skills for employment / Employability (Asterisk Criterion) |             |                              | X                          |                                    |      |

## 4. Academic environment and framework conditions

### 4.1 Faculty

Based on the applicable laws and regulations, the UNG has the authority to recruit human resources. Based on Law Number 14 of 2005 concerning teachers and lecturers, lecturers at UNG consist of full-time and part-time lecturers. Full-time lecturers are teaching staff who work full-time with the status of permanent educators in the UNG academic community, while part-time lecturers are teaching staff who work part-time with the status of non-permanent educators.

**Table 12: Academic staff of the Faculty of Mathematics and Natural Sciences in 2022**

| Lecturers                                  | Lecturer of Study Programme |                     |                   |                     |
|--|-----------------------------|---------------------|-------------------|---------------------|
|  | Biology Education           | Chemistry Education | Physics education | Geography Education |
| Professor                                  | 5                           | 3                   | 1                 | -                   |
| Associate Professor                        | 10                          | 9                   | 8                 | 2                   |
| Assistant Professor                        | 10                          | 12                  | 9                 | 10                  |
| Lecturers                                  | 1                           | 0                   | 4                 | -                   |
| Part-Time Lecturer                         | 2                           | 3                   | 4                 | 2                   |
| Total of Full-Time and Part-Time Lecturers | 28                          | 27                  | 26                | 14                  |
| Lecturer to student ratio                  | 1:12                        | 1:9                 | 1:8               | 1:24                |
| Full-Time Teaching Equivalence             | 12 - 16 CP                  |                     |                   |                     |

By number, the ratio of students and academic positions of study programme lecturers at the Faculty of Mathematics and Natural Sciences UNG has met the national higher education standards.

Based on Law number 14 of 2005 concerning Teachers and Lecturers article 46, lecturers for teaching undergraduate programmes have to have a minimum academic qualification of a master's degree obtained through an accredited postgraduate programme according to the expertise field.

The criteria for full time and part time lecturers are:

1. Full time lecturers are civil servants who work at UNG which have been determined by the Ministry of Education, Culture, Research, and Technology. The main task of the lecturer is to carry out the Tridharma of Higher Education (teaching, research and community service) with a workload of at least 12 (twelve) SKS credits and a maximum of 16 (sixteen) SKS credits in each semester in accordance with academic qualifications. The source of salary funding permanent lecturers comes from the government through the State Budget.
2. Part time lecturers are lecturers who work part-time with the status of permanent educators in certain educational units. Part time lecturers do not have the obligation of Lecturer Workload, but are given space to carry out the Tridharma of Higher Education in accordance with their field of expertise which includes education and teaching activities, research activities and community service activities.

Qualification and number of lecturers required for putting the study programme into practice are proposed by the Head of the Study Programme to the Faculty of Mathematics and Natural Sciences. The faculty submits the results of the needs analysis of lecturers from each study programme to the University. The analysis is then forwarded to Indonesia's Ministry of Education, Culture, Research, and Technology.

Recruitment of lecturers begins by identifying need for lecturers, which is carried out by adhering to an analytical procedure as follows:

- 1) Identifying the need for the number of lecturers in each study programme (Prodi) based on the Lecturer Workload. A lecturer's workload is defined in the Decree of the Director-General of Higher Education of the Ministry of Education and Culture No. 12/E/KTP/2021 concerning Operational Guidelines for Lecturer Workload.
- 2) Identifying the need for the number of lecturers in each study programme based on the ratio of lecturers to students in the natural sciences field of 1:30. Based on this, the planning and estimation of the needs of UNG lecturers is obtained from the calculation of the number of students divided by the lecturer-student ratio.
- 3) The study programme proposes the needs of lecturers based on considerations of academic qualifications and competencies that are in accordance with the type of knowledge needed in the modules of each study programme.
- 4) The results of the identification, analysis and proposed needs of lecturers are submitted to the faculty and forwarded to university level.
- 5) UNG proposed the formation of lecturer needs to the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia.

Universitas Negeri Gorontalo recruits its lectures in two ways, namely:

1. Full-time lecturers (as civil servants) recruitment is composed of three stages, include the administrative selection, basic competency selection and the field competency selection (teaching ability test and interview).
2. Part-time lecturers' recruitment has three stages include the administrative selection, objective test, teaching ability test and interview. Unlike full-time lecturers and following the University's strategic plan, part-time lecturers are planned for only five years.

Requirements for lecturers who apply for promotion as professors must have a doctoral certificate in the field of science that is in accordance with the field of assignment science and have published scientific works after doctoral education in reputable international journals with Scientific Journal Rankings (SJR) above 0.1 or have a Web of Science Journal Impact Factor (WoS JIF) of at least 0.05. In addition to these mandatory requirements, there are several additional requirements:

- a. Have received a competitive research grant for regional/national/ministry/international/corporate level assignments, or internal university competition (as chairman, except for thesis/dissertation programme research); or
- b. Have guided/assisted in supervising the doctoral programme; or
- c. Have examined at least three doctoral programme students (either at their own university or at other universities); or



- d. Have served as a reviewer in at least two reputable international journals.

The functional position of the professor can be achieved if the number of credit points that meet the requirements is 850 points with the following proportions.

- a. Education: 35 %
- b. Research: 45 %
- c. Community service: 10 %
- d. Supporting element: 10 %

The efforts that UNG has made to encourage lecturers to achieve professor qualifications are:

- a. Scientific writing training
- b. Incentives for publications of international repute
- c. Patent drafting training
- d. Professor's research grant
- e. Financial assistance for the management of professors

The development of lecturer staff refers to Law no. 14/2005 concerning Teachers and Lecturers (article 69) and the Minister of Research, Technology and Higher Education Regulation Number 82 of 2017 concerning the Statute of UNG. These regulations stipulate that the guidance and development of lecturers include professional and career coaching and development.

Professional guidance and development of lecturers include four competencies, including pedagogic, personality, social and professional competence. Professional guidance and development of lecturers are carried out through further functional positions for lecturer careers, including assignments, promotions, further study of doctoral at various universities both at national and overseas universities, participating in scientific conferences, collaborative projects and promotions.

Improving the ability of lecturers in foreign languages is done through training activities, participation in international conferences, and holding bilingual lectures.

Lecturers are required to enroll in the Instructional Engineering Skills Improvement Programme (PEKERTI) and the Applied Approach (AA) to improve pedagogic and didactic competence. The PEKERTI programme (specifically for young lecturers) and the AA programme (specifically for senior lecturers) are two training programmes intended to improve the professional competence, especially pedagogical skills of lecturers.

PEKERTI training is training to improve the professional competence of lecturers, especially pedagogical skills. The Applied Approach (AA) training is a follow-up programme for the PEKERTI Programme. AA training trains lecturers to have insight in learning which includes Lecturer Professionalism Development Policies in the Implementation of Quality Learning, Moral Ethics in Learning, Integrated Quality Management, Constructivism in Learning, Reconstruction of Modules, Writing Teaching Materials, Basic Concepts and Paradigms of Curriculum Development, Model-Active and Innovative Learning Models, Learning Evaluation, Alternative Assessment, and Classroom Action Research (CAR) Applications.

In addition, lecturers are also given the opportunity to attend seminars and research proposal writing training, research article writing training, research-based book writing and book chapter training, service proposal writing training, service article writing training and assessor training.

**Table 13: Number of Lecturers Participating in Pedagogic Training till 2021**

| Study programme     | Lecturer Development Efforts |     |                  |                                  |   |                                 |              |
|---------------------|------------------------------|-----|------------------|----------------------------------|---|---------------------------------|--------------|
|                     | PEKERTI                      | A A | Blended Learning | Active Learning in School (ALIS) | Active Learning in Higher Education (ALIHE) | Case Method/ Team Based Project | Lesson Study |
| Biology Education   | 24                           | 23  | 3                | 4                                | 4   | 8                               | 3            |
| Physics education   | 14                           | 11  | 3                | 6                                | 6   | 8                               | 2            |
| Chemistry Education | 23                           | 21  | 9                | 6                                | 6   | 8                               | -            |
| Geography Education | 9                            | 9   | 5                | 1                                | 3   | 12                              | -            |

Lecturer staff in each study programme at the Mathematics and Natural Sciences faculty have professional practice experience, both relevant and irrelevant to the field of education. Table 9 shows the distribution of lecturers who have professional practice.

**Table 14: Industrial Experience of Study Programme Lecturers**

| Industrial Experience  | Number of Lecturers with Industrial Experience |                   |                   |                     |
|--|--|-------------------|-------------------|---------------------|
|  | Chemistry Education                            | Biology Education | Physics Education | Geography Education |
| Assignment at School   | 3  | 2                 | 2                 | 3                   |
| School assessor  | 1  | 5                 | 0                 | 0                   |
| Auditor of the Institute for the Study of Food, Drugs and Cosmetics of the Indonesian Ulema Council Gorontalo Province | 10   | 1                 | 0                 | 0                   |
| Experts in Research and Community Service Institutions for Higher Education Services Region XVI                        | 1  | 0                 | 0                 | 0                   |
| Assessor of Environmental Impact Analysis  | 1  | 1                 | 0                 | 1                   |

| Industrial Experience   | Number of Lecturers with Industrial Experience |                   |                   |                     |
|---|--|-------------------|-------------------|---------------------|
|   | Chemistry Education                            | Biology Education | Physics Education | Geography Education |
| Geographic Information System (GIS) training instructor   | 0  | 0                 | 0                 | 3                   |
| Consultant to the National Population and Family Planning Agency at the Regency and Provincial levels of Gorontalo              | 1  | 5                 | 4                 | 1                   |
| Management of the Center for the Development and Application of Traditional Medicine Gorontalo Province                         | 1  | 1                 | 0                 | 1                   |
| Expert Staff at Local Government  | 2  | 0                 | 1                 | 0                   |
| Management of the Communication Forum for the Prevention of Terrorism of Gorontalo Province - National Counter-Terrorism Agency | 1  | 2                 | 0                 | 0                   |
| Indonesian Association of Practitioners and Demographers  | 1  | 5                 | 0                 | 1                   |
| Preparation of Environmental Impact Analysis  | 1  | 3                 | 0                 | 2                   |
| Preparation of Strategic Environmental Studies  | 0  | 2                 | 0                 | 2                   |
| Environmental monitoring of industrial activities   | 1  | 3                 | 0                 | 2                   |
| Raising awareness activities on mercury impacts for the local community   | 0  | 0                 | 0                 | 6                   |
| Competency Assessor   | 0  | 0                 | 0                 | 2                   |

Collaboration between lecturers in each study programme is carried out in several fields, namely teaching, research and community service.

All modules at the Faculty of Mathematics and Natural Sciences are held by team teaching and teams of two or three lecturers. The teams jointly prepare Semester Learning Plans (SLP). They

conduct lectures in class, compile assessments and joint materials, and evaluate lectures in the middle and end of the semester. In research activities, groups of lecturers work together to conduct research and publications. Lecturers of the education study programme periodically carry out community service, mainly in schools, where lecturers act as consultants for the teachers regarding the Mathematics and Natural Science's learning model.

The support of study programme for students include:

- **Academic Advisor:** The academic advisors are assigned by the faculty to assist and guide students encountering academic problems. The academic advisory process can be carried out face-to-face, online through the Integrated Academic Information System or through other communication tools
- **Guidance and counseling:** Guidance and counseling services provided for UNG's students are carried out by the Guidance and Counseling Service Unit. Counselor lecturers provide counseling services for students served face-to-face with counselors or online through e-counseling facilities. The service scope, facilities, schedule and service flow of the guidance and counseling service can be accessed through UNG's website, but is not available in English.
- Each student is allowed to consult and contact the lecturer both during working hours and non-working hours related to the lecture process / final project guidance. Lecturer services are conducted face-to-face or online through the Integrated Academic Information System, or other communication tools.

## Appraisal:

Even when their teaching assignments in other study programmes are taken into account, the structure and number of the two faculties correspond to the programmes' requirements and ensure that the students reach the intended qualification objectives.

During the assessment conference, the panel addressed the fact that in the Bachelor of Geography Education programme the lecturer to student ratio is much lower than in the other programmes. The panel learned that two professors in geography are currently assigned. With respect to methods in human geography (see condition in chapter 3.1), the panel recommends ensuring that qualifications in human geography are taken into account when appointing new faculty. Furthermore, the panel recommends that new faculty should have experience in sustainability topics that come together with global change.

The faculty's composition for all study programmes, consisting of full-time and part-time lecturers, guarantees that both the academic standards and the requirements of professional practice are fully satisfied.

The academic qualification of the faculties corresponds to the requirements and objectives of the study programmes. The University verifies the qualifications of the faculty members by means of an established procedure. Specific measures for the further qualification of the faculty members are implemented.

The pedagogical and didactical qualification of the faculty corresponds to the requirements and objectives of the study programmes. The University verifies the qualifications of the faculty

members by means of an established procedure. UNG ensures that assessors are familiar with existing testing and examination methods and receive support in developing their own skills in this field. Specific measures for the further qualification of the faculty members are implemented. As can be seen in table 13, in the Bachelor of Geography Education programme only one lecturer participated in the ALIS programme. Therefore, the panel recommends improving the school-related qualifications of the lecturers.

The practical business experience of the faculty corresponds to the requirement of the programme to integrate theory and practice.

The faculty members cooperate with each other for the purpose of tuning the modules towards the overall qualification objectives. Meetings of all those teaching in the programme take place regularly. The panel suggests also implementing a meeting/workshop annually or once per semester, where lecturers exchange on problems encountered during teaching or on developing examinations (see also chapter 3.1/3.2).

Student support is an integral part of the services provided by the faculty. It is offered on a regular basis and serves to help students study successfully. During the assessment conference, the panel got the impression that there is a very positive relationship between lecturers and students. The students praised the support and expressed the impression that the lecturers follow an open door policy.

|          |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|----------|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 4.1      | Faculty  |             |                              |                            |                                    |      |
| 4.1.1*   | Structure and quantity of faculty in relation to curricular requirements (Asterisk Criterion)                                    |             |                              | X                          |                                    |      |
| 4.1.2*   | Academic qualification of faculty (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 4.1.3*   | Pedagogical / didactical qualification of faculty (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 4.1.4    | Practical business experience of faculty   |             |                              | X                          |                                    |      |
| 4.1.5*   | Internal cooperation (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 4.1.6*   | Student support by the faculty (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 4.1.7(*) | Student support in distance learning (only relevant and an Asterisk Criterion for blended-learning/distance learning programmes) |             |                              |                            |                                    | X    |

## 4.2 Programme management

Based on the Decree of the Dean of the Faculty of Mathematics and Natural Sciences Number 1558/UN47.B4/OT/2019, the Head of the study programme has the task of coordinating, planning, supervising, and evaluating the implementation of academic activities, including:

- a. improving the quality of education, research, community service (Tridharma of higher education), and partnership cooperation at the study programme level ;

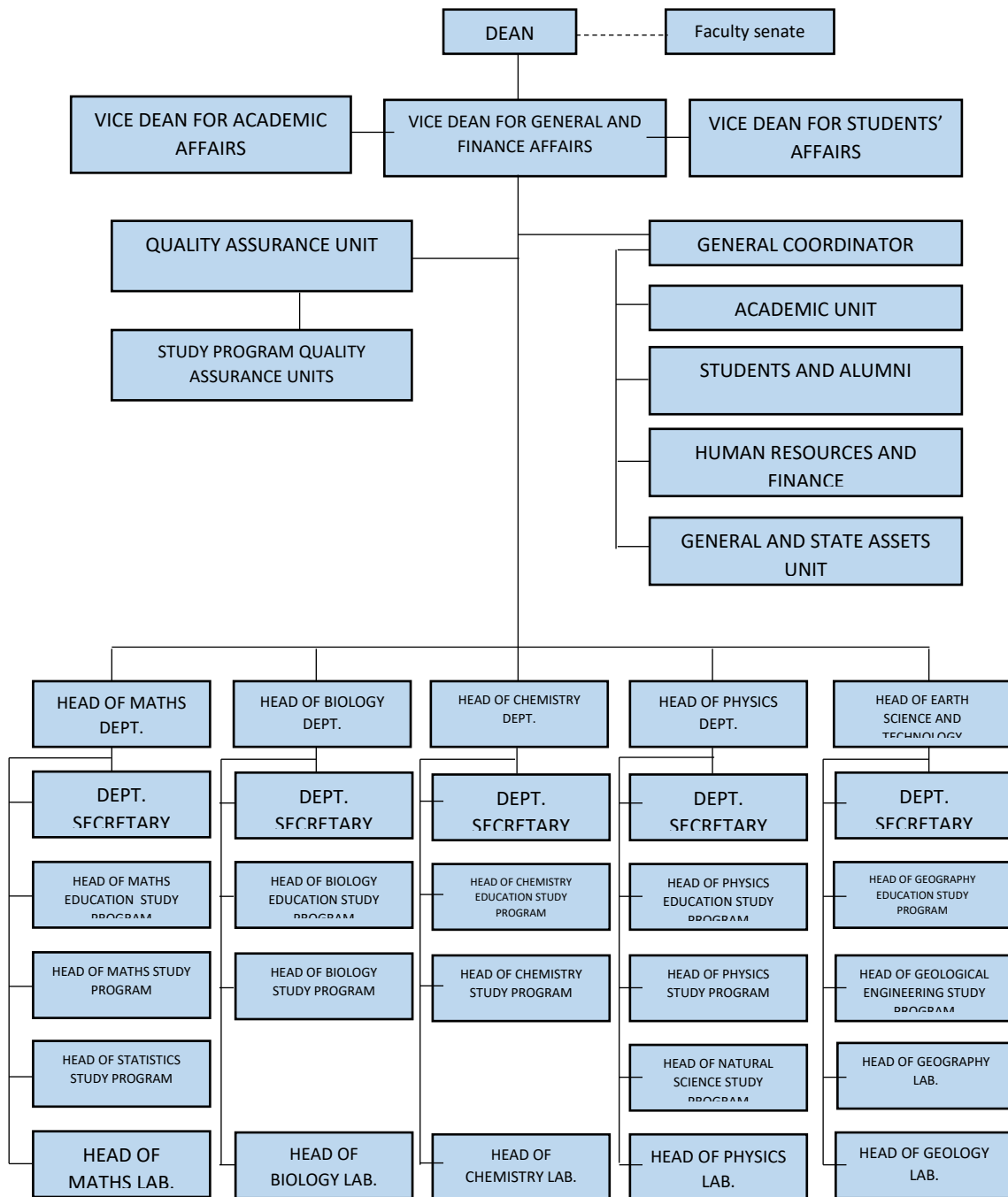
- b. ensuring the academic quality of the study programme;
- c. preparing study plans and work programmes as work guidelines;
- d. arrange team teaching based on considerations from the study programme meeting;
- e. assign supervision for Introduction to School Environment, Field Work, Student Community Service, or Internship;
- f. assign supervisors and thesis examiners, proposal seminars, results seminars;
- g. evaluating the length of study and the GPA (Grade Point Average) of the students;
- h. coordinate preparing and revising the study programme curriculum;

Requirements for becoming Head of the study programme are:

- a. civil servant status
- b. academic position at least Assistant Professor
- c. good managerial skills

All study programmes under review rely on human resources and facilities managed by the Faculty of Mathematics and Natural Sciences. Based on the Decree of the Dean of the Faculty of Mathematics and Natural Science Number 1558/UN47.B4/OT/2019, the Faculty of Mathematics and Natural Science organisation's structure includes the Senate, Dean, Deputy Dean, Head of Department, Head of Study Programme, Head of Laboratory, Lecturer, General Administration Coordinator, and Quality Assurance Group.

**Table 15: Organisational Structure of the Faculty of Mathematics and Natural Sciences**



The general coordinator of the Faculty of Mathematics and Natural Science oversees the academic section's implementation, the personnel section, the finance section, the student affairs section and the administrative support. The study programmes are supported by an administrative staff of 30 people. The education staff handles the needs of students and lecturers related to administration.

In detail, administrative services to students and lecturers by the executives of the section are:

- a. The academic unit is responsible for providing and running academic administrative services,

including education and teaching, research, and community service. Academic administration services include student registration, course selection sheet and course result sheet, the input of lecture schedules and midterm examination/final examination schedules, use of academic rooms and facilities, administration of lectures and public lectures, midterm examination/final examination, students community service, introduction to school environment, field work, proposal seminars, results seminars, exams bachelor; graduation registration.

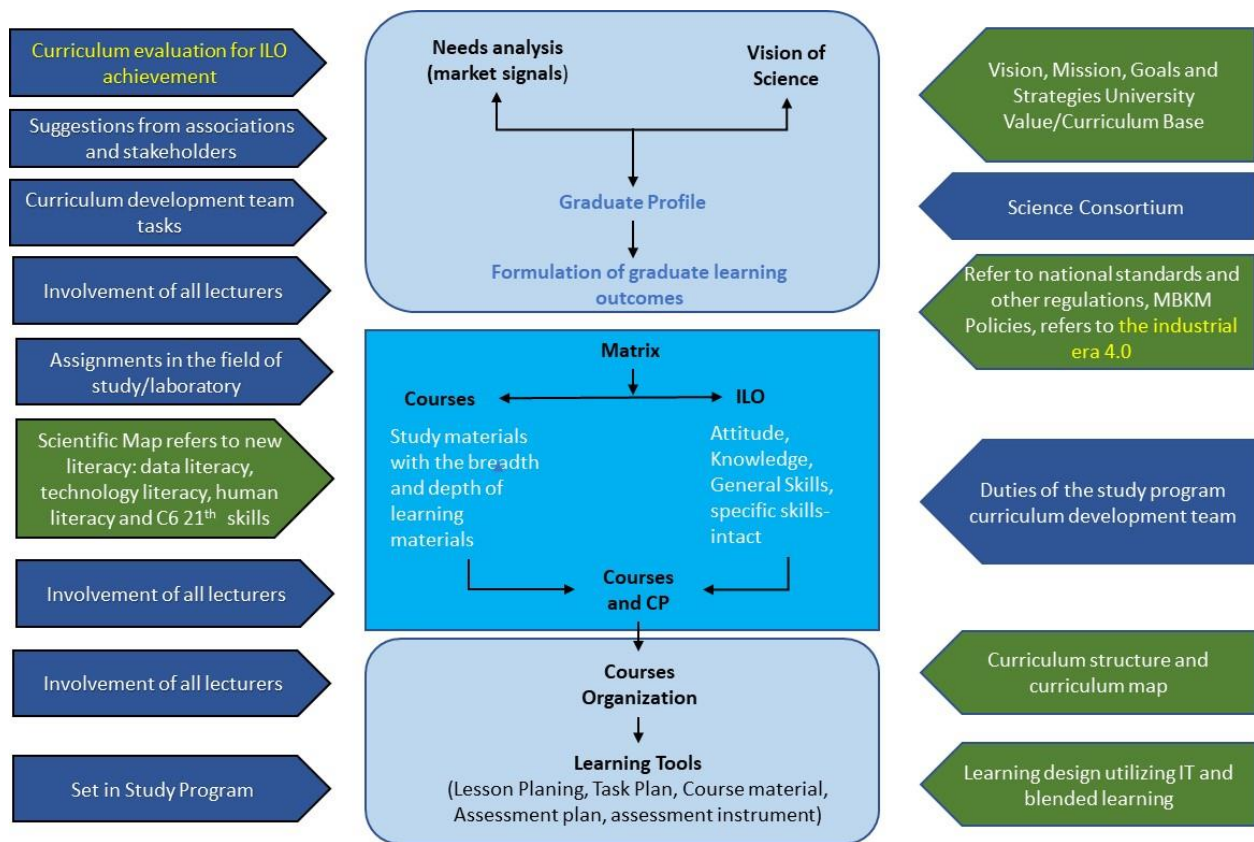
- b. The personnel section is responsible for carrying out administrative activities for staffing transfers, including placement arrangements, periodic salary increases, promotions, and pensions; providing employee welfare services; store and maintain employee records; and managing the rules and regulations regarding employment.
- c. The finance section is responsible for carrying out financial administrative and administrative activities. Duties carried out by the executor of the finance department include planning and disbursing budgets, financial transactions, compiling a list of salaries, honoraria, incentives, remuneration, overtime pay and official travel.
- d. The student section is responsible for providing student administration services and alumni relations. The student affairs duties include administration and administration of co-curricular activities, disseminating information and distributing student scholarships, coordinating guidance and counseling services for students. In addition, it helps in coordinating the implementation of student coaching activities, collecting and storing alumni data, providing alumni services, and assisting the implementation of relations and cooperation between faculty and alumni.
- e. The general section is responsible for providing general administrative services and equipment and running general administrative services and affairs and state property, administration, and faculty housekeeping.

The Vice Rector II coordinates with Vice Dean II of the Faculty of Mathematics and Natural Sciences through the University and Faculty Personnel Section to manage and improve the qualification of educational staff. The effort to improve the qualification of educational staff is carried out by providing opportunities to improve managerial competence, technical competence, promotion, and improvement of academic qualifications.

Developing the curricula under review adhered to guidelines for the preparation of the Higher education curriculum, according to Regulation by the Ministry of Education and Culture No. 12 of 2012 and Regulation of the Minister of Education and Culture No. 3 of 2020 about National Standards for Higher Education. The stages of curriculum preparation are divided into three stages: curriculum design, learning design, and evaluation of learning programmes.



**Table 16: Stages of preparing curriculum documents**



### Appraisal:

Programme directors of alle programmes under review coordinate the activities of everyone involved in the programmes and ensure that the programmes run smoothly.

Faculty members and students are supported by the administration in the organisation of the study programme at programme, faculty and university level. Sufficient administrative staff is available. Decision-making processes, authority and responsibilities are clearly defined. Teachers and students are included in the decision-making processes where their areas of work are involved. The panel acknowledges that there are structures in place to involve students in the decision-making process, but recommends formalising the system through documentation in order to ensure consistency and clarity.

Options of electronic service-support are used and supplement personal one-to-one counselling to students. The panel emphasised that students have electronic access to their grading. UNG offers the administrative staff opportunities for continuous professional development.

|  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 4.2 Programme management   |             |                              |                            |                                    |      |
| 4.2.1* Programme Director (Asterisk Criterion)                                 |             |                              | X                          |                                    |      |
| 4.2.2 Process organisation and administrative support for students and faculty |             |                              | X                          |                                    |      |

### 4.3 Cooperation and partnerships

Universitas Negeri Gorontalo continues to improve cooperation with other universities both domestically and abroad. Referring to the Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 14 of 2014 concerning Higher Education Cooperation, the cooperation programme aims to increase the effectiveness, efficiency, productivity, creativity, innovation, quality, and relevance of the implementation of the Tridharma (three main pillars) of Higher Education (education, research, community service).

The cooperation policy of the Faculty of Mathematics and Natural Sciences UNG refers to:

1. Decree of the Rector of UNG Number 28/UN47/KS/2014 concerning the Legal Basis for Implementation of Cooperation, Strategy for Implementation of Cooperation, and Methods for Implementation of Cooperation
2. Regulation of the Rector of the UNG regarding the Policy for the Implementation of the Independent Learning Curriculum Cooperation-Independent Campus Number:1060/UN47/HK.02/2020

The mechanism for collaboration between universities established by the UNG, namely the cooperation agreement between universities, is stated in a memorandum of understanding between university leaders. Cooperation agreements between the faculty deans follow up to the memorandum of understanding. Cooperation activities with universities are prioritised to provide benefits especially for students, such as student exchanges, research, and service. Cooperation between universities can also be useful in improving the quality of the curricula.

Cooperations between the Faculty of Mathematics and Natural Sciences of UNG with other universities in foreign country are with Ehime University (Japan) and Universiti Malaysia Terengganu (Malaysia). The Faculty of Mathematics and Natural Sciences of UNG cooperates with 17 other universities in Indonesia.

**Table 17: University Cooperations of the Faculty of Mathematics and Natural Sciences**

| Cooperation             | Scope of Cooperation          | Benefits for Study Programmes   |
|-------------------------|-------------------------------|---|
| Ehime University, Japan | International Transfer Credit | Improving students' hard skills and soft skills, expanding and strengthening networks, as well as a better understanding of the |

|   |   |   |
|---|---|---|
|   |   | socio-cultural aspects of foreign nations                       |
| Universiti Malaysia Terengganu  | International Webinars                  | Increasing the insight of students and lecturers                |
|   | Practitioner Lecturer                   | Increasing students' insight and knowledge                      |
| Universitas Negeri Manado (UNIMA)   | Student Exchange                        | Improving academic competence and student experience            |
|   | Bestari Partners of Scientific Journals | Improving the quality of scientific journals for study programs |
| Gadjah Mada University  | Job training                            | Increasing students' insight, experience, and skills            |
| Sriwijaya University  | International Webinars                  | Increasing students' insight, experience, and skills            |
| Open University (UT)  | Lecturer                                | Increasing students' insight, experience, and skills            |
| Universitas Negeri Padang (UNP);<br>Universitas Negeri Makassar (UNM);<br>Universitas Negeri Semarang (UNNES);<br>Universitas Negeri Jakarta (UNJ);<br>Universitas Negeri Yogyakarta (UNY);<br>Indonesian University of Education (UPI);<br>Universitas Negeri Surabaya (UNESA);<br>Universitas Negeri Malang (UM);<br>Ganesha University of Education (UNDIKSHA);<br>Universitas Negeri Medan (UNIMED) | Student Exchange                        | Improving academic competence and student experience            |
| Tadulako University; Universitas Lambung Mangkurat; Mulawarman University (UNMUL)   | Student Exchange                        | Increasing students' insight, experience, and skills            |

Cooperation and partnerships between universities and the business sector, industry, government organisations and non-governmental organisations continue to be increased in order to improve the quality of education and services of the UNG. Collaborations are conducted with the private sector and government, both domestically and abroad. Students' benefit from cooperations of this kind by gaining insights into operational and organisational structures of potential fields of employment, particularly in economy, on different levels of workforce hierarchy. Students' benefits also include development of entrepreneurial and leadership abilities.

The Ministry of Education, Culture, Research, and Technology strongly supports the internship programme through the Independent Learning Campus policy (MBKM), one of which is the work internship programme. The internship programme supports developing career opportunities by directly involving students into workflows in industry, expanded networks and professional relationships. Internship programmes are also very useful for universities, including establishing relationships for cooperating with companies not only improving graduates' quality, but also becoming potential stakeholders. Furthermore the Faculty of Mathematics and Natural Sciences

cooperates with business organizations, companies in industry, government organisations and non-governmental organisations, as provided in an summary by the University<sup>22</sup>.

## Appraisal:

The University provided a list of all co-operations and partnerships. Universitas Negeri Gorontalo (UNG) maintains professional relationships with selected partners from academia, industry and administration. The scope and nature of such cooperation with HEIs, other academic institutions and networks, as well as business enterprises and other institutions relevant for the programme are plausibly presented. The agreements forming the basis of the cooperation are documented. All cooperations are actively pursued and have a clear impact on the conception and implementation of the study programmes under review. All such activities contribute to the development of the students' qualification and skills. In order to strengthen the profile of the University's regional research and education, the panel recommends focusing on non-university research institutions and NGOs for cooperations in terms of research and supervision of students.

|   | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|---|-------------|------------------------------|----------------------------|------------------------------------|------|
| 4.3 Cooperation and partnerships  |             |                              |                            |                                    |      |
| 4.3.1(*) Cooperation with HEIs and other academic institutions or networks (Asterisk Criterion for cooperation programmes)                                  |             |                              | X                          |                                    |      |
| 4.3.2(*) Cooperation with business enterprises and other organisations (Asterisk Criterion for educational and vocational programmes, franchise programmes) |             |                              | X                          |                                    |      |

## 4.4 Facilities and equipment

The infrastructure of the Faculty of Mathematics and Natural Sciences serves a total of twelve study programmes offered by the faculty. Arrangements for the use of these facilities are regulated by faculty institutions. Facilities and infrastructure available at the Faculty of Mathematics and Natural Sciences include, among others:

- 24 Lecture rooms, including smart rooms (2,700 m<sup>2</sup>)
- 24 Laboratory rooms (2,700 m<sup>2</sup>)
- 2 Microteaching rooms (136 m<sup>2</sup>)
- 1 Library/reading room (1,500 m<sup>2</sup>)
- 1 Journal Management room (32 m<sup>2</sup>)

<sup>22</sup>

<https://docs.google.com/document/d/1jgpMDKOHWHHe5js7CjoNembTptk3GTp45/edit?usp=sharing&ouid=114650646963144830715&rtpof=true&sd=true>

Activities associated with the faculty furthermore take profit from infrastructure provided by the university in general, and other faculties in particular, on the basis of resource sharing. These infrastructure facilities include, among others:

- 2 Microteaching rooms (80 m<sup>2</sup>)
- UNG Library (2,260 m<sup>2</sup>)
- Language Center Building (450 m<sup>2</sup>)

According to the self-evaluation report (pages 44 pp.), the Faculty of Mathematics and Natural Sciences provides adequate infrastructure for people with special needs. This is reflected in the quality standards of the UNG in 2017. The Faculty of Mathematics and Natural Sciences provides guiding information on the roads and corridors of the campus environment for those with special needs.

The campus provides exhaustive internet access for students throughout the campus for learning purposes. The Integrated Academic Information System (LMS, <https://siat.ung.ac.id/>) provides a number of academic information services and online learning services for students and lecturers.

UNG library has an area of 2,260 m<sup>2</sup>, extending across four stories in a separate building. The library hosts approximately 23,000 books, both printed and e-books. Students can access the library from Monday to Friday (8 AM to 4 PM) and Saturday (8 AM to 12 PM). Information regarding the central library is available through the library's website<sup>23</sup>. To facilitate students, the library also provides guidelines for library guides, scientific work references (APA 7 style), thesis proposal preparation, Turnitin, and reference searches. The library also offers a number of study places for students.

**Table 18: Types and Numbers of UNG Library Collections**

| No | Types of Collection   | Number of Titles | Number of Copies |
|----|-----------------------|------------------|------------------|
| 1  | Book                  | 7,808            | 24,490           |
| 2  | Reference             | 1,916            | 2,906            |
| 3  | Special Collection    | 277              | 314              |
| 4  | National Journal      | 119              | 697              |
| 5  | International Journal | 15               | 63               |
| 6  | BI Corner             | 307              | 307              |
| 7  | Magazine              | 87               | 1,694            |
| 8  | Newspaper             | 3                | 1,228            |
| 9  | Thesis                | 9,,183           | 9,183            |
| 10 | Cassette Tape         | 694              | 694              |
| 11 | Compact Disk          | 1900             | 1,900            |
| 12 | E-book                | 230              | 230              |

Currently, the library provides access to the following international subscriptions, databases and archives:

- [www.proquest.com](http://www.proquest.com)
- [www.ebsco.com](http://www.ebsco.com)
- Wiley Online Library

<sup>23</sup> <https://perpustakaan.ung.ac.id>, last call October 20, 2022

- mylibrary
- Cambridge University Press
- Britannica Library and Britannica E-Books
- Cengage Learning
- Brill online
- <https://e-resources.perpusnas.go.id/> (national Library of Indonesia)
- Access Science
- Sage Books
- World Scientific
- Springer Nature
- CABI
- Science Direct

## Appraisal:

The assessment conference was held as a hybrid conference, four members of the panel team did not visit Universitas Negeri Gorontalo onsite. The University provided a video showing the facilities. Furthermore, the panel members onsite visited the laboratories and provided videos about the laboratories for the panel members that participated digitally in the assessment conference. According to the panel, the quantity, quality, media and IT facilities of the teaching rooms meet the standards required for the programmes, even taking into account resources demanded by other study programmes. During the assessment conference the panel noted that a lift is missing in the faculty building. In its statement, UNG pointed out that there are currently no disabled students in the Faculty of Mathematics and Natural Sciences, but that UNG is committed to prepare facilities for disabled students such as elevators, guiding block tactile paving, wheelchairs, disabled toilets, etc. UNG also provided a rector commitment on these measurement, together with the obligation to provide an appropriate budget in the next budget plan.

To foster interactive working, the panel recommends equipping some of the teaching rooms with pinboards and presentation kits.

Access to the internet through laptops via wireless LAN is provided free of charge. A sufficient number of group rooms are available. What is more, UNG utilises a digital Learning Management System enabling students to access information and documents from campus and from home.

For the Bachelor of Chemistry Education the panel encountered conditions in laboratories that do not match international safety standards. As for technical equipment, fume hoods, safety showers and eyewashes are missing. Laboratory coats and goggles were used by most students, but gloves worn by students while handling hazardous compounds were found to be insufficient based on the material, for protecting experimenters against health hazards. Also, the number of ventilated safety cupboards, according the panel's judgement are too few, for storing acids, bases, volatile hydrocarbons and compounds for analytical purposes as required by regulations. Other instruments, such as rotary evaporators with cooling traps in synthesis of instruments for structure elucidation may be considered to be replaced by newer equipment, when funding allows.

In its statement, UNG pointed out that the Chemistry laboratory has been upgraded according to the safety standards for laboratory use. Standard laboratory safety equipment is available and used for laboratory activities. Acid storage cabinets (acids, bases, and hydrocarbons) are available in

the Chemistry Laboratory. Laboratory equipment in the form of evaporators has been purchased and is currently on delivery process. UNG also provided a video of the updated laboratory equipment.

The panel acknowledges that UNG has worked constructively on advanced safety standards. However, the improved standards do not yet fulfil all of the requirements. Therefore, the panel recommends the following **condition** for the programme Bachelor of Chemistry Education:

The University takes the following steps to ensure sufficient safety standards in the laboratories:

- a) The University proves the provision of a sufficient number of laboratory coats, goggles and adequate gloves for protecting students against chemical hazards.
- b) The University develops a decisive plan (including scheduling and budgeting) to ensure sufficient safety standards in the laboratories concerning the technical equipment.

For the Biology laboratory, the panel states sufficient, but outdated equipment. As further equipment will be a matter of funding, the panel recommends aiming at co-operations with research institutions that would allow students to gain access to more modern laboratory equipment. The panel provides a sample list of the Biology Laboratory at Osnabrück University (see table 27, end of report). The panel acknowledges that UNG might not be able to fund the same amount of material for their respective students' numbers, but regardless of the quantity of the individual items, the list could serve as a rough guide to what a possible equipment might look like.

In order to intensify the bonds into the local and regional society, the panel suggests considering the idea of a school students laboratory in Biology. UNG may regularly invite biology classes to conduct classical experiments (mainly genetics and microbiology) which are lead by the school teachers. The panel has provided a list of equipment for the biology laboratory that Osnabrück University runs for school students (see table 28, end of report).

There is a main library at University level. The opening hours of the library take students' needs sufficiently into account. The library provides access to an appropriate range of physical literature and journals as well as to digital media (e.g. electronic media, databases, e-journals, e-books, and archives). The literature expressly required for the study programme is available in the library and also kept up to date. The literature is also available from the students' home or anywhere at campus via a remote access. However, the panel learned during the assessment conference that students can lend the books for three days. The panel recommends extending this period. As the panel also realised that standard literature is not always available in sufficiently up-to-date editions, the panel also recommends reviewing the process of updating the inventory of textbooks both in Indonesian and in English. In reviewing the need of students for obtaining modern education based on contemporary information from newest possible books, the panel suggests updating literature offered by the library in English language.

|        |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|--------|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 4.4    | Facilities and equipment   |             |                              |                            |                                    |      |
| 4.4.1* | Quantity, quality, media and IT equipment of teaching and group rooms (Asterisk Criterion) |             |                              | BBE<br>BPE<br>BGE          | BCE:<br>condition                  |      |
| 4.4.2* | Access to literature (Asterisk Criterion)  |             |                              | X                          |                                    |      |

## 4.5 Additional services

UNG has established a Student Career Development Center in 2016 to support student career advancement. This unit consists of four fields: Creativity Sector, Entrepreneurship Sector, Career Field and Alumni Sector. For graduates who will enter the job market, the study programmes are in close coordination with the online career centre<sup>24</sup>. The career center is responsible for providing coaching and job-ready training, conducting career counseling and placement service by On Campus Recruitment and job fairs. Preparatory training activities for entering the world of work such as job interviews, CV writing workshops and writing job application letters as well as job counseling are scheduled before graduation. From these training activities, the career service generates data about prospective graduates and their competencies which will later be used for promotion to schools and companies.

A description of student activities for the CDC services provided by the UNG and the utilisation of students of the four study programmes is shown in the following table:

**Table 19a: Career Development Centre Activities**

| No | CDC Activity Type   | Date             | Number of Students Involved |                   |                   |                     |
|----|---|------------------|-----------------------------|-------------------|-------------------|---------------------|
|    |   |                  | Chemistry Education         | Biology Education | Physics Education | Geography Education |
| 1  | Danamon sharing session: Dynamics and Career Opportunities in Banking | March 18, 2022   | 0                           | 0                 | 2                 | 1                   |
| 2  | Entrepreneur Seminar  | January 19, 2022 | 4                           | 4                 | 4                 | 4                   |
| 3  | Entrepreneur Workshop   | August 3, 2021   | 10                          | 12                | 16                | 11                  |

<sup>24</sup> <https://www.ung.ac.id/pageshow/2/karir-center>



|   |   |                     |   |    |   |    |
|---|---|---------------------|---|----|---|----|
| 4 | Campus Talk: Kampus Merdeka Edition “How to Plan for Life after Graduation” | January 10, 2022    | 9 | 15 | 8 | 12 |
| 5 | Career Training for Working and Higher Education                            | October 13-14, 2021 | 1 | 1  | 1 | 1  |
| 6 | The Award Ceremony for Students and Alumni                                  | September 2, 2020   | 1 | 1  | 1 | 3  |
| 7 | Career Training and Counseling “Career in Pandemic Era”                     | July 2-4, 2020      | 6 | 9  | 8 | 2  |
| 8 | Entrepreneurship Online Seminar   | June 15, 2020       | 4 | 1  | 6 | 6  |

UNG Alumni are members of the UNG Alumni Association on University level. The UNG Alumni Association supervises alumni associations at the faculty and study programme level. There is an alumni association at the faculty level of the Faculty of Mathematics and Natural Sciences and all graduates are also members of the respective alumni organisations on department level (Biology, Physics, Chemistry and Sciences and Earth Technology Department). Activities of the respective alumni associations are shown in the following table:

**Table 19b: Work Programme of the Alumni Association**

| Alumni              | Work program   |  |  |   |
|---------------------|--|--|--|---|
|                     | Chemistry Education  | Biology Education  | Physics education  | Geography Education   |
| University Level    | <ul style="list-style-type: none"> <li>Speakers for career training workshops</li> <li>Speakers for scholarships workshops</li> </ul>                              |  |  |   |
| Faculty Level       | <ul style="list-style-type: none"> <li>Projector grant</li> <li>Sound system Set grant</li> <li>Podium grant</li> </ul>  |  |  |   |
| Study Program Level | <ul style="list-style-type: none"> <li>Department Socialization</li> <li>Strengthening the Competency of Chemistry Teachers for Chemistry Teacher Forum</li> </ul> | <ul style="list-style-type: none"> <li>Socialization of Departments and Study Programs</li> <li>National Seminar involving alumni</li> <li>Utilization of laboratories in learning</li> <li>Alumni donation</li> </ul> | <ul style="list-style-type: none"> <li>Book Grant</li> <li>Projector Grant</li> <li>Dispenser and Refrigerator Grant</li> <li>Leader of basic</li> </ul> | <ul style="list-style-type: none"> <li>Book Grant</li> <li>Projector grant</li> <li>Leader of basic leadership training</li> <li>Instructor of Terrain and Compass Introduction Science Activities</li> </ul> |

| Alumni | Work program   |  |                     |   |
|--------|--|--|---------------------|---|
|        | Chemistry Education  | Biology Education  | Physics education   | Geography Education   |
|        | <ul style="list-style-type: none"> <li>• School strengthening in project-based learning in chemistry</li> <li>• Strengthening the competence of laboratory managers</li> <li>• Collaboration in practicum, research and journal activities.</li> <li>• Book Grant</li> <li>• Projector grant</li> <li>• Leader of basic leadership training</li> </ul> | <ul style="list-style-type: none"> <li>• Involvement of alumni as presenters in Basic and Field Education activities for new students</li> <li>• Alumni involvement in webinar activities to motivate students towards employment and further studies</li> </ul> | leadership training | <ul style="list-style-type: none"> <li>• Speaker for webinar</li> </ul> |

## Appraisal:

Career counselling and placement services are offered to students and graduates to promote their employability. These services include, among other, a career fair, workshops and career trainings, as well as a career club. UNG provides sufficient resources to be able to offer these activities on a regular basis.

At University and faculty level, an alumni organisation has been set up with the aim of developing an alumni network.

|       |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|-------|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 4.5   | Additional services                      |             |                              |                            |                                    |      |
| 4.5.1 | Career counselling and placement service |             |                              | X                          |                                    |      |
| 4.5.2 | Alumni Activities                        |             |                              | X                          |                                    |      |

## 4.6 Financing of the study programme (Asterisk Criterion)

Universitas Negeri Gorontalo is one of the universities included in public service agency. With the State Revenue and Expenditure Budget and Non-Tax State Revenue funding, the University guarantees that students can complete their studies on time. The form and mechanism of funding for all study programmes refer to Government Regulation no. 26 of 2015 and Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 82 of 2017 concerning the Statute of the UNG Chapter XIV Article 101 Paragraphs 1 and 2. Funding comes

from the central government, local government, community, and other legal and non-binding sources. Furthermore, sources of funding originating from other than the government consist of the cost of organising education, the outcome of cooperation and proceeds from the sale of products/services obtained from the organisation of higher education. Also, other sources come from donations/grants from individuals or institutions that are legal and not binding and other acceptances that are not binding and do not conflict with the provisions of laws and regulations.

**Appraisal:**

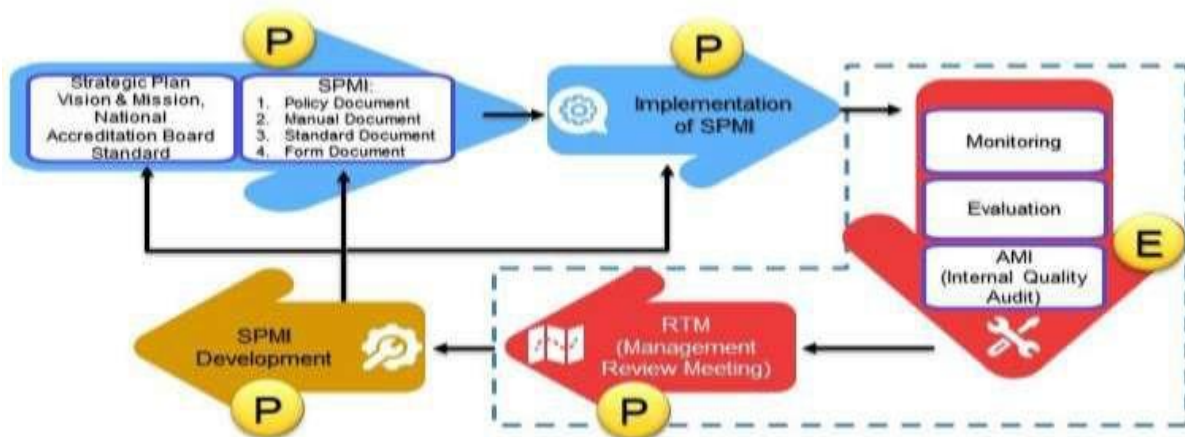
UNG is a state-owned University and is therefore largely financed by the state. Moreover, the University receives income from student tuition fees and from other services and businesses. The study programme is are funded for the entire accreditation period so that students will definitely be able to complete their studies. (As for recommendations on investments in the laboratory infrastructure, see chapter 4.4.)

|      |   | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|------|---|-------------|------------------------------|----------------------------|------------------------------------|------|
| 4.6* | Financing of the study programme (Asterisk Criterion) | X           |                              |                            |                                    |      |

## 5. Quality assurance and documentation

The internal quality assurance system (Sistem Penjaminan Mutu Internal, SPMI) is developed and implemented by UNG's Office of Quality Assurance (PPM), the external quality assurance system is secured on the basis of accreditation. The following graph shows the internal process of quality assurance in UNG:

Table 20: Internal Process of Quality Assurance at UNG



SPMI includes quality determination procedures, implementation of quality standards, evaluation of quality achievements, control and improvement of quality standards. SPMI's principles are to be oriented towards internal and external stakeholders; participatory and collegial; transparent; as well as accountable.

The scope of SPMI policy focuses on eight areas:

- 1) Education
- 2) Research
- 3) Community service
- 4) Student and alumni
- 5) Cooperation
- 6) Provision of facilities and infrastructure
- 7) student creativity
- 8) Capacity building for lecturers and education staff

Based on this fields of activities the SPMI covers several quality standard clusters.

- Academic Quality Standards include: Education; Research; and Community Service Quality Standards.
- Education Quality Standards include: Graduate competency; Learning Content; Learning Process; Learning Assessment; Lecturers and Education Personnel; Learning Facilities; Learning Management; Learning Financing.
- Research Quality Standards include: Research Results; Research Content; Research Process; Research Assessment; Research; Research Infrastructures; Research Management; Funding and Research Financing.

- Community Service Quality Standards include: Community Service Outcomes; Community Service Content; Community Service Processes; Community Service Assessment; Implementing; Community Service Infrastructure Facilities; Community Service Management; Funding and Community Service Financing.
- Non-academic Quality Standards include: Identity (Vision, Mission and Goals); Governance, Leadership, Governance and Quality Assurance; Cooperation; Student and Alumni; Human Resources; Facilities and Infrastructure; Information Systems; Finance; Risk Management.

UNG has compiled the scope of the SPMI policy into three periods as follows:

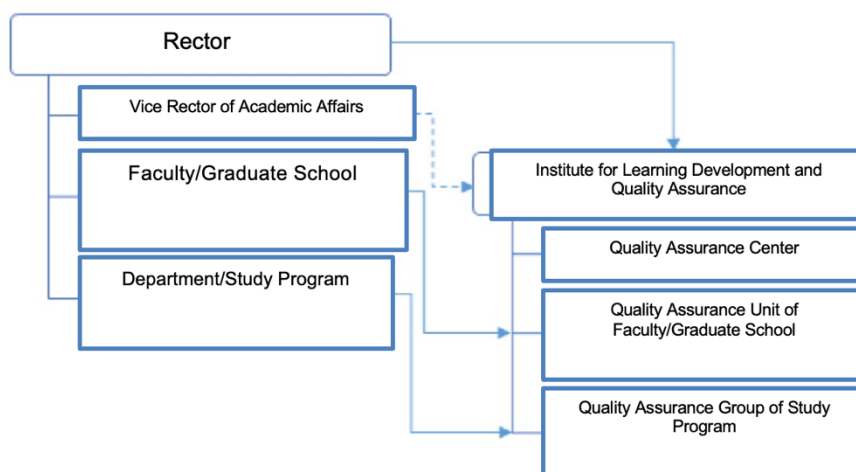
1. SPMI Development Phase 2017 – 2022: SPMI is focused on achieving academic quality standards according to the National Higher Education Standards, then gradually towards achieving non-academic quality standards
2. Stage of Strengthening SPMI Period 2022 – 2026: SPMI is fully implemented in all work units within the UNG environment. Some of the study programmes have exceeded the achievement of the National Higher Education Standards and UNG as a higher education institution is preparing itself for a World Class University (WCU).
3. Stage of Achieving Quality Excellence Period 2026 – 2030: SPMI is upgraded to exceed the National Standard for Higher Education and some study programmes have been accredited by International Accreditation Agencies.

The SPMI UNG policy is applied to all units within UNG, namely University, faculties, postgraduates, bureaus, institutions, centers, UPT, departments / study programmes, and Laboratories, both academically and non-academically.

The quality assurance organisation at UNG is as follows:

- a. University level: Senate, Rector, Quality Assurance Center
- b. Faculty Level: Faculty Senate, Faculty Quality Assurance Unit (SK Faculty Quality Assurance )
- c. Department / Study Programme Level: Study Programme Quality Assurance Group (SK Study Programme Quality Assurance) .

**Table 21: Organisational Structure of UNG's Internal Quality Assurance System**



Implementation of SPMI at the study programme level is carried out routinely every semester by the study programme quality assurance group in coordination with the Head of the study programme, faculty leaders and the Faculty quality assurance unit.

In the field of education and teaching, monitoring activities in one semester are carried out in three stages:

- The first stage of monitoring is carried out at the beginning of the semester, at this stage monitoring is carried out in the second week to determine the level of attendance of lecturers, students, delivery of lesson plan (LP) by lecturers, Learning Resources (Dictation/Teaching Materials), and completeness of lectures.
- The second stage of monitoring is carried out in the 9th week. This monitoring aims to examine the extent to which lecture activities until the 8th week are running. At this stage monitoring and evaluation includes presence of lecturers, student attendance, implementation of the Mid-Test Examination (MTE), discussion/return of MTE results, and the suitability of the target-realisation of lectures until mid-term according to the lesson plan or not.
- The third stage of monitoring is carried out at the end of the semester. At this stage, it is monitored and evaluated the implementation of LP and handouts, implementation of Final-Term Examination, Submission of Final Score (FS), and analysis of the success rate of lectures and the implementation of lectures. The quality assurance process is carried out according to the quality manual.

As part of UNG's vision and mission to satisfy its internal and external stakeholders, the University has developed a Quality Standard Document containing various criteria, benchmarks and specifications for higher education implementation activities. Furthermore, in implementing academic and non-academic quality standards, there is an Internal Quality Assurance System

(IQAS) document<sup>25</sup>, which can be accessed by graduate users and stakeholders, students, lecturers, administrative and educational staff, stakeholders and university management.

In the self-evaluation report (page 52), the University states that feedback from students is crucial. The questionnaires can be accessed by students at the end of each semester, through their respective accounts at <http://siat.ung.ac.id>.

- a. Survey on Understanding of Vision, Mission, Goals and Targets
- b. Survey of student satisfaction on lecturers' learning performance: During each semester, students are responsible for evaluating the implementation of learning. Students will give an assessment of several indicators with a scale of 1 to 4 where 1 is “Poor”, 2 is “Fair”, 3 is “Good”, and 4 is “Excellent”. Some of the indicators that become student assessments can be seen in the following table.

**Table 22: Student Assessment Indicators**

| No. | Student Assessment Indicators | Description  |
|-----|-------------------------------|--|
| 1.  | Reliability                   | The ability of lecturers to convey learning objectives, explain learning materials, use learning medias, methods used, and updating information related to learning materials. |
| 2.  | Responsiveness                | The openness of lecturers in receiving suggestions or input from students and making the active participation of students more evenly distributed.                             |
| 3.  | Empathy                       | The form of lecturer's concern for students to provide guidance on assignments, pay attention to class conditions and serve student needs.                                     |
| 4.  | Assurance                     | Pay attention to student attendance, the appropriateness of teaching time, and the completeness of lectures in comparison to the expected competencies.                        |
| 5.  | Tangible                      | Availability of lesson plans, learning contracts, teaching materials to the form of assessment instruments by lecturers.   |
| 6.  | Suggestion/Comment            | Students provide input regarding facilities and services that have met expectations, and which still need to be improved.  |

Results of evaluations by students will be processed by the Quality Assurance Division (QAD) of the study programme. The results will then be coordinated with the Head of Undergraduate Programme and the Dean of Faculty as a reference in formulating recommendations for programme improvement. Evaluation results and improvement plans that have been prepared by the study programme will be conveyed to students through direct meetings between the study programme and students.

<sup>25</sup> <https://penjamu.ung.ac.id/files/gorontalo/file/file/formulir-mutu-ung-2022/1648375262.pdf>

Efforts are made to increase the capacity and ability of lecturers, namely assigning lecturers to participate in self-development, workshops, and conducting lecturer exchanges. If the lecturer does not provide improvement, the study programme can apply sanctions by limiting the number of classes taught by the lecturer or even temporarily stopping the lecturer's teaching activities.

Evaluation by lecturers can be carried out at the beginning and end of each semester through meetings between lecturers in each study programme. Lecturers can provide input related to improving learning facilities. Inputs and evaluations by lecturers are analysed and followed up by the Head of the study programme. The results of the analysis and evaluation by the Head of Undergraduate Programme are then conveyed to the lecturers through meetings or circular letters.

Alumni can provide evaluations related to the development of study programmes by filling out forms or questionnaires available at <https://tracerstudy.ung.ac.id>. In addition, each study programme holds a Curriculum Workshop periodically by inviting employers and third parties, such as partner institution and study programme associations to develop a curriculum that is appropriate and can answer the needs of various parties. Alumni, employers and third parties can give an input related to institutional development, curriculum content, and graduate self-development through "Quality Assurance" column on the faculty website <http://fmipa.ung.ac.id>. The results of the evaluation will also be published on the study programme and faculty pages that can be accessed by alumni, graduate users and third parties.

Information on all all academic and non-academic activities of the study programmes is contained in the faculty website<sup>26</sup> and the respective websites for the study programmes<sup>27</sup>.

Documented and published content includes study programme profiles, curriculum profiles, lecturers profile, infrastructure, research and community service, publications, Study programme development with partners and stakeholders (both domestic and international), student organisations, student achievements, lecturer and student innovation products, scholarship information, national seminars, international seminars, and guest lectures. Additionally, academic and non-academic activities are also published on social media (instagram and facebook) and youtube platform. The study programme website describes the curriculum, beginning with the scientific vision and mission, study programme objectives, expected graduate profiles, curriculum structure, course distribution and course handbooks.

The study programmes' academic activities are verified through accountability reports. Accountability performance are reported to department and faculty leaders periodically through official meetings. Performance evaluations of lecturers and educational staff are reported annually in the form of a Job Performance Assessment List, Employee Performance Target, and Lecturer workload reports.

---

<sup>26</sup> <http://fmipa.ung.ac.id/en>

<sup>27</sup> Biology Education: <http://biologyedu.fmipa.ung.ac.id/en>, last call October 20,2022

Chemistry Education: <http://chemed.fmipa.ung.ac.id/en>, last call October 20,2022

Physics Education: <http://physicsed.fmipa.ung.ac.id/en>, last call October 20,2022

Geography Education: <http://geografi.fmipa.ung.ac.id/en>, last call October 20,2022



## Appraisal:

During the hybrid conference, the panel got insights into the quality assurance and development processes for the study programmes that have been set up. Evaluations of the study courses, the lecturers and the University in general are carried out on a regular basis, which systematically and continuously monitor and develop the quality of the programme with respect to its contents, processes and outcomes. Responsibilities are clearly defined.

A quality assurance and development procedure, which systematically and continuously monitors and develops the quality of the programme with respect to its contents, processes, and outcomes, has been set up. This system takes into account evaluation results and analysis on success rate, graduate employment as well as the student population. Faculty members and students participate in the respective committees to plan and assess the quality assurance and development procedures. Responsibilities are clearly defined.

Evaluation by the students, quality control by the faculty and external evaluation is carried out on a regular basis and in accordance with a prescribed procedure; the outcomes are communicated and provide input for the quality development process.

In its statement to the report, UNG also provided evaluation reports that show a detailed evaluation concerning the actual workload of the students within the single modules, thus delivering information whether the actual workload of the whole module corresponds to the estimated workload (including teaching time, self-study time and examination), exceeds or falls short of the given value.

Additionally, graduates and representatives from the professional side are included in the process since they also give feedback on the study programme. Success rate and graduate employment are taken into account. All four study programmes have the national “A” accreditation that also includes the quality management system.

Evaluation results are communicated via website. However, during the assessment conference, the panel learned that this seems not always to be notified by the target groups. Communicating the results to students, faculty and external stakeholders (employers, alumni) beyond website information is not established as a process. The panel therefore recommends implementing a process that regulates content and procedure of communicating evaluation results to students, faculty and external stakeholders in addition to website publishing.

The study programme’s content, curriculum and examination scheme have been suitably documented and published.

Moreover, Universitas Negeri Gorontalo regularly publishes current news and information – both quantitative and qualitative – about the study programme. These are distributed via the website of UNG and social media accounts.

The study programme’s content, curriculum and examination scheme have been suitably documented and published. UNG regularly publishes current news and information – both quantitative and qualitative – about the study programme. However the panel noted that the information is not consistently available in English (e.g. student counseling<sup>28</sup> and sometimes dates

---

<sup>28</sup> <https://www.ung.ac.id/page/show/2/pelayanan-bimbingan-dan-konseling>, last call October 20, 2022

back as far as 2015<sup>29</sup>). Therefore, the panel recommends ensuring regular updating of the website and ensuring that all information about the study programmes is also available in English.

|        |   | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|--------|---|-------------|------------------------------|----------------------------|------------------------------------|------|
| 5.1*   | Quality assurance and quality development with respect to contents, processes and outcomes (Asterisk Criterion) |             |                              |                            | condition                          |      |
| 5.2    | Instruments of quality assurance  |             |                              |                            |                                    |      |
| 5.2.1  | Evaluation by students  |             |                              | X                          |                                    |      |
| 5.2.2  | Evaluation by faculty   |             |                              | X                          |                                    |      |
| 5.2.3  | External evaluation by alumni, employers and third parties  |             |                              | X                          |                                    |      |
| 5.3    | Programme documentation   |             |                              |                            |                                    |      |
| 5.3.1* | Programme description (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 5.3.2  | Information on activities during the academic year  |             |                              | X                          |                                    |      |

<sup>29</sup> <https://www.ung.ac.id/en/#admission> (bottom right), last call October 19, 2022

# Quality profile

HEI: Universitas Negeri Gorontalo

**Bachelor programmes:** Bachelor of Biology Education (BBE), Bachelor of Chemistry Education (BCE), Bachelor of Physics Education (BPE), Bachelor of Geography Education (BGE),

|          |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r.      |
|----------|--|-------------|------------------------------|----------------------------|------------------------------------|-----------|
| <b>1</b> | <b>Objectives</b>  |             |                              |                            |                                    |           |
| 1.1*     | Objectives of the study programme (Asterisk Criterion)   |             |                              | X                          |                                    |           |
| 1.2*     | International orientation of the study programme design (Asterisk Criterion)   |             |                              | X                          |                                    |           |
| 1.3      | Positioning of the study programme   |             |                              |                            |                                    |           |
| 1.3.1    | Positioning of the study programme in the educational market   |             |                              | X                          |                                    |           |
| 1.3.2    | Positioning of the study programme on the job market for graduates („Employability“)                                 |             |                              | X                          |                                    |           |
| 1.3.3    | Positioning of the study programme within the HEI's overall strategic concept  |             |                              | X                          |                                    |           |
| <b>2</b> | <b>Admission</b>   |             |                              |                            |                                    |           |
| 2.1*     | Admission requirements (Asterisk Criterion)  |             |                              | X                          |                                    |           |
| 2.2      | Counselling for prospective students   |             |                              | X                          |                                    |           |
| 2.3*     | Selection procedure (if relevant)  |             |                              | X                          |                                    |           |
| 2.4(*)   | Professional experience (if relevant; Asterisk Criterion for master programmes that require professional experience) |             |                              |                            |                                    | X         |
| 2.5*     | Ensuring foreign language proficiency (Asterisk Criterion)   |             |                              | X                          |                                    |           |
| 2.6*     | Transparency and documentation of admission procedure and decision (Asterisk Criterion)                              |             |                              | X                          |                                    |           |
| <b>3</b> |  |             |                              |                            |                                    |           |
| 3.1      |  |             |                              |                            |                                    |           |
| 3.1.1*   | Logic and conceptual coherence (Asterisk Criterion)  |             |                              | X                          |                                    |           |
| 3.1.2*   | Rationale for degree and programme name (Asterisk Criterion)   |             |                              | X                          |                                    |           |
| 3.1.3*   | Integration of theory and practice (Asterisk Criterion)  |             |                              | X                          |                                    |           |
| 3.1.4    | Interdisciplinary thinking   |             |                              | X                          |                                    |           |
| 3.1.5    | Ethical aspects  |             | X                            |                            |                                    |           |
| 3.1.6*   | Methods and scientific practice (Asterisk Criterion)   |             |                              | BBE<br>BCE<br>BPE          | BGE:<br>condition                  |           |
| 3.1.7*   | Examination and final thesis (Asterisk Criterion)  |             |                              | X                          |                                    |           |
| 3.2      | Structure  |             |                              |                            |                                    |           |
| 3.2.1*   | Modular structure of the study programme (Asterisk Criterion)  |             |                              |                            |                                    | condition |

|          |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|----------|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 3.2.2*   | Study and exam regulations (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 3.2.3*   | Feasibility of study workload (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 3.2.4    | Equality of opportunity  |             |                              | X                          |                                    |      |
| 3.3      | Didactical concept   |             |                              |                            |                                    |      |
| 3.3.1*   | Logic and plausibility of the didactical concept (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 3.3.2*   | Course materials (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 3.3.3    | Guest lecturers  |             |                              | X                          |                                    |      |
| 3.3.4    | Lecturing tutors   |             |                              | X                          |                                    |      |
| 3.4      | Internationality   |             |                              |                            |                                    |      |
| 3.4.1*   | International contents and intercultural aspects (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 3.4.2    | Internationality of the student body   |             |                              |                            | X                                  |      |
| 3.4.3    | Internationality of faculty  |             |                              | X                          |                                    |      |
| 3.4.4    | Foreign language contents  |             |                              | X                          |                                    |      |
| 3.5*     | Multidisciplinary competences and skills (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 3.6*     | Skills for employment / Employability (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 4.       | <b>Academic environment and framework conditions</b>   |             |                              |                            |                                    |      |
| 4.1      | Faculty  |             |                              |                            |                                    |      |
| 4.1.1*   | Structure and quantity of faculty in relation to curricular requirements (Asterisk Criterion)                                    |             |                              | X                          |                                    |      |
| 4.1.2*   | Academic qualification of faculty (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 4.1.3*   | Pedagogical / didactical qualification of faculty (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 4.1.4    | Practical business experience of faculty   |             |                              | X                          |                                    |      |
| 4.1.5*   | Internal cooperation (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 4.1.6*   | Student support by the faculty (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 4.1.7(*) | Student support in distance learning (only relevant and an Asterisk Criterion for blended-learning/distance learning programmes) |             |                              |                            |                                    | X    |
| 4.2      | Programme management   |             |                              |                            |                                    |      |
| 4.2.1*   | Programme Director (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 4.2.2    | Process organisation and administrative support for students and faculty   |             |                              | X                          |                                    |      |
| 4.3      | Cooperation and partnerships   |             |                              |                            |                                    |      |
| 4.3.1(*) | Cooperation with HEIs and other academic institutions or networks (Asterisk Criterion for cooperation programmes)                |             |                              | X                          |                                    |      |

|          |  | Exceptional | Exceeds quality requirements | Meets quality requirements | Does not meet quality requirements | n.r. |
|----------|--|-------------|------------------------------|----------------------------|------------------------------------|------|
| 4.3.2(*) | Cooperation with business enterprises and other organisations (Asterisk Criterion for educational and vocational programmes, franchise programmes) |             |                              | X                          |                                    |      |
| 4.4      | Facilities and equipment   |             |                              |                            |                                    |      |
| 4.4.1*   | Quantity, quality, media and IT equipment of teaching and group rooms (Asterisk Criterion)   |             |                              | BBE<br>BPE<br>BGE          | BCE:<br>condition                  |      |
| 4.4.2*   | Access to literature (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| 4.5      | Additional services  |             |                              |                            |                                    |      |
| 4.5.1    | Career counselling and placement service   |             |                              | X                          |                                    |      |
| 4.5.2    | Alumni Activities  |             |                              | X                          |                                    |      |
| 4.6*     | Financing of the study programme (Asterisk Criterion)  |             |                              | X                          |                                    |      |
| <b>5</b> | <b>Quality assurance and documentation</b>   |             |                              |                            |                                    |      |
| 5.1*     | Quality assurance and quality development with respect to contents, processes and outcomes (Asterisk Criterion)                                    |             |                              | X                          |                                    |      |
| 5.2      | Instruments of quality assurance   |             |                              |                            |                                    |      |
| 5.2.1    | Evaluation by students   |             |                              |                            | X                                  |      |
| 5.2.2    | Evaluation by faculty  |             |                              |                            | X                                  |      |
| 5.2.3    | External evaluation by alumni, employers and third parties   |             |                              |                            | X                                  |      |
| 5.3      | Programme documentation  |             |                              |                            |                                    |      |
| 5.3.1*   | Programme description (Asterisk Criterion)   |             |                              | X                          |                                    |      |
| 5.3.2    | Information on activities during the academic year   |             |                              |                            | X                                  |      |

## Annex

Table 23: Curriculum Bachelor of Biology Education

### Curriculum Overview Bachelor of Biology Education, 8 Semesters

#### 1<sup>st</sup> Semester

| Modul No.  | Title of Module / Course Unit | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                 | weight of exam related to final grade |  |
|------------|-------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|---|---------------------------------------|--|
|            |                               | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   |                                       |  |
| NAS4260112 | Religion                      | 2                          |   |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Drs. Wahab<br>2. Rudy Harolo<br>3. Dewa Gede      |
| NAS4260212 | Pancasila                     | 2                          |   |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Rasyid Yunu<br>2. Prof. Dr. An<br>3. Dr. Lilan Da |
| NAS4260412 | Bahasa Indonesia              | 2                          |   |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Dr. Herman<br>2. Ayu Hidayar                      |
| DAA260112  | Calculus                      | 2                          |   |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Drs. Sumarn<br>2. Khardiyawa                      |
| UNG4260512 | Culture                       | 2                          |   |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Dr. Asna Nte<br>2. Mira Mirnav                    |
| UNG4260912 | Introduction to Education     | 2                          |   |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Dr. Lilan Da<br>2. Dr. Hartono<br>3. Ilyas Husain |

|            |                 |   |  |  |  |  |  |  |  |       |    |     |   |     |  |
|------------|-----------------|---|--|--|--|--|--|--|--|-------|----|-----|---|-----|--|
| DAA260212  | General Biology | 2 |  |  |  |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Prof. Dr. No<br>2. Dra. Aryati<br>3. Prof. Dr. Ma |
| DAA260412  | Basic Chemistry | 2 |  |  |  |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dra. Nurhay<br>2. Hendri Iyab                     |
| DAA260312  | Basic Physics   | 2 |  |  |  |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Abdul Ha<br>2. Abd. Wahid                     |
| UNG4260622 | English         | 2 |  |  |  |  |  |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70% | 1. Titin Fatmav<br>2. Muh. Nur AH                    |

## 2<sup>nd</sup> Semester

| Modul No.  | Title of Module / Course Unit      | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                 | weight of exam related to final grade |  |
|------------|------------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|---|---------------------------------------|--|
|            |                                    | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   |                                       |  |
| NAS4260322 | Civics                             |                            | 2 |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Asmun Wan   |
| UNG4261022 | Learner Development                |                            | 2 |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Dr. Lilan Da<br>2. Ilyas Husain                                     |
| DAG61122   | Laboratory Technique               |                            | 2 |   |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Winangsi D.<br>2. Syam S. Kur<br>3. Herinda Ma                      |
| DAG61323   | Biochemistry                       |                            | 3 |   |   |   |   |   |   | 35,00          | 84               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Dra. Aryati A<br>2. Dr. Yuliana                                     |
| DAG61422   | Animal Structure and Development 1 |                            | 2 |   |   |   |   |   |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Dr. Djuna la<br>2. Prof. Dr. Ma<br>3. Drs. Mustan<br>4. Muh. Nur Al |
| DAG61622   | Plant Structure and Development 1  |                            | 2 |   |   |   |   |   |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Dr. Jusna Ah<br>2. Prof. Dr. No<br>3. Febriyanti,                   |

|           |                    |  |   |  |  |  |  |  |  |       |    |     |   |     |  |
|-----------|--------------------|--|---|--|--|--|--|--|--|-------|----|-----|---|-----|--|
| DAG61822  | Plant Diversity 1  |  | 2 |  |  |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Winangsi D.<br>2. Syam S. Kur<br>3. Febriyanti,   |
| DAG62022  | Animal Diversity 1 |  | 2 |  |  |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Chairun<br>2. Regina Vale<br>3. Ilyas Husain  |
| DAG62723  | Cell Biology       |  | 3 |  |  |  |  |  |  | 35,00 | 84 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Djuna La<br>2. Prof. Dr. Ma<br>3. Drs. Mustan |
| DAA260522 | Science Philosophy |  | 2 |  |  |  |  |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70% | 1. Prof. Dr. Ra<br>2. Dr. Lilan Da<br>3. Abubakar Si |

### 3<sup>rd</sup> Semester

| Modul No. | Title of Module / Course Unit      | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                 | weight of exam related to final grade |  |
|-----------|------------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|---|---------------------------------------|--|
|           |                                    | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   |                                       |  |
| DAG61532  | Animal Structure and Development 2 |                            |   | 2 |   |   |   |   |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Dr. Djuna La<br>2. Prof. Dr. Ma<br>3. Drs. Mustan<br>4. Muh. Nur Al |
| DAG61732  | Plant Structure and Development 2  |                            |   | 2 |   |   |   |   |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Dr. Jusna Ah<br>2. Prof. Dr. No<br>3. Febriyanti,                   |
| DAG61932  | Plant Diversity 2                  |                            |   | 2 |   |   |   |   |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Prof. Dr. No<br>2. Dr. Jusna Ah<br>3. Febriyanti,                   |



|          |                                      |  |  |   |  |  |  |  |  |       |    |     |   |     |   |
|----------|--------------------------------------|--|--|---|--|--|--|--|--|-------|----|-----|---|-----|---|
| DAG62132 | Animal Diversity 2                   |  |  | 2 |  |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Chairunnisa<br>2. Regina Vale<br>3. Ilyas Husain                   |
| DAG62232 | Genetics 1                           |  |  | 2 |  |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Elya Nussa<br>2. Dr. Frida Mariani<br>3. Dra. Aryati               |
| DAG65232 | Professional for Teacher Development |  |  | 2 |  |  |  |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70% | 1. Dr. Lilan Daryanti<br>2. Dr. Jusna Ahsan<br>3. Dr. Frida Mariani       |
| DAG65433 | Ecology                              |  |  | 3 |  |  |  |  |  | 35,00 | 84 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Prof. Dr. Rani<br>2. Dr. Dewi Wati<br>3. Dr. Marini S<br>4. Abubakar S |
| DAG65532 | Local genius literacy                |  |  | 2 |  |  |  |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70% | 1. Prof. Dr. Rani<br>2. Dr. Chairunnisa<br>3. Dr. Lilan Daryanti          |
| DAG65632 | Edu-tourism                          |  |  | 2 |  |  |  |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70% | 1. Dr. Marini S<br>2. Dr. Dewi Wati<br>3. Ilyas A. Husain                 |
| DAG65732 | Ethnoscience                         |  |  | 2 |  |  |  |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70% | 1. Dr. Jusna Ahsan<br>2. Prof. Dr. Rani<br>3. Dr. Chairunnisa             |

#### 4<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit    | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | weight of exam related to final grade |   |
|-----------|----------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|-----------------------------------|---------------------------------------|---|
|           |                                  | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |                                       |   |
| DAG67042  | Learning and Instruction Biology |                            |   |   | 2 |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)              | 70%                                   | 1. Dr. Frida Mariani<br>2. Dr. Lilan Daryanti<br>3. Ilyas A. Husain |

|          |                                   |  |  |  |  |   |  |  |  |  |       |    |     |   |     |   |
|----------|-----------------------------------|--|--|--|--|---|--|--|--|--|-------|----|-----|---|-----|---|
| DAG60842 | Genetics 2                        |  |  |  |  | 2 |  |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Elya Nus<br>2. Dr. Aryati A<br>3. Dr. Frida Ma                 |
| DAG61243 | Human Anatomy and Physiology      |  |  |  |  | 3 |  |  |  |  | 35,00 | 84 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Djuna la<br>2. Prof. Dr. Ma                                    |
| DAG62443 | Research Methodology in Education |  |  |  |  | 3 |  |  |  |  | 35,00 | 84 | L   | Exam Paper /Presentation/(200 Min)                | 70% | 1. Prof. Dr. Ra<br>2. Dr. Lilan Da<br>3. Abubakar Si                  |
| DAG62943 | Animal Physiology                 |  |  |  |  | 3 |  |  |  |  | 35,00 | 84 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Dr. Margare<br>2. Dr. Djuna La                                     |
| DAG63043 | Plant Physiology                  |  |  |  |  | 3 |  |  |  |  | 35,00 | 84 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Prof. Dr. No<br>2. Dr. Jusna AH<br>3. Febriyanti,                  |
| DAG64942 | Evolution                         |  |  |  |  | 2 |  |  |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70% | 1. Dr. Frida Ma<br>2. Dr. Elya Nus<br>3. Dra. Aryati                  |
| DAG65043 | Microbiology                      |  |  |  |  | 3 |  |  |  |  | 35,00 | 84 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Prof. Dr. An<br>2. Wirnangsi D<br>3. Dr. Yuliana<br>4. Syam S. Kur |

### 5<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit        | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                 | weight of exam related to final grade |   |
|-----------|--------------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|---|---------------------------------------|---|
|           |                                      | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   |                                       |   |
| DAG65852  | Media Production in Biology Learning |                            |   |   |   | 2 |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Dr. Lilan Da<br>2. Siti Suhada<br>3. Muh. Nur AK |

|          |                 |  |  |  |  |  |   |  |  |  |       |    |     |   |     |  |
|----------|-----------------|--|--|--|--|--|---|--|--|--|-------|----|-----|---|-----|--|
| DAG62852 | Biostatistics   |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Abubakar S<br>2. Moh. Rezky<br>3. Drs. Mustam                     |
| DAG63252 | Biotechnology   |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% | 1. Wirnangsi D<br>2. Dr. Yuliana<br>3. Syam S. Kur<br>4. Dr. Amin NU |
| -        | Elected Courses |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |  |
| -        | Elected Courses |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |  |
| -        | Elected Courses |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |  |
| -        | Elected Courses |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |  |
| -        | Elected Courses |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |  |
| -        | Elected Courses |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |  |
| -        | Elected Courses |  |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |  |

### 6<sup>th</sup> Semester

| Modul No.  | Title of Module / Course Unit | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                 | weight of exam related to final grade |                                     |
|------------|-------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|---|---------------------------------------|-------------------------------------|
|            |                               | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   |                                       |                                     |
| UNG4260862 | Entrepreneurship              |                            |   |   |   |   | 2 |   |   | 23,33          | 56               | P                            | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   | 1. Prof. Dr. Ani<br>2. Dr. Marini H |

|            |   |  |  |  |  |  |  |   |  |  |       |    |     |   |      |  |
|------------|---|--|--|--|--|--|--|---|--|--|-------|----|-----|---|------|--|
| UNG4261562 | Introduction to School Environment 1              |  |  |  |  |  |  | 2 |  |  | 23,33 | 56 | P   | Practical Exam (200 Min)                          | 100% | 1. Prof. Dr. Hj.<br>2. Wirnangsi D<br>3. Prof. Dr. Ma<br>4. Abubakar S<br>5. Prof. Dr. No<br>6. Dra. Aryati<br>7. Dr. Lilan Da<br>8. Dr. Elya Nus<br>9. Dr. Hartono<br>10. Dr. Masra<br>11. Dr. Chairur<br>12. Dr. Frida M |
| DAG60563   | Biology Instructional Curriculum                  |  |  |  |  |  |  | 3 |  |  | 35,00 | 84 | L   | Exam Paper (200 Min)                              | 70%  | 1. Dr. Elya Nus<br>2. Dr. Hartono<br>3. Ilyas A. Hus   |
| DAG60662   | Biology Instructional Strategies                  |  |  |  |  |  |  | 2 |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70%  | 1. Dr. Masra La<br>2. Dr. Elya Nus<br>3. Ilyas A. Hus  |
| DAG60763   | Biology Instructional Evaluation                  |  |  |  |  |  |  | 3 |  |  | 35,00 | 84 | L   | Exam Paper (200 Min)                              | 70%  | 1. Dr. Lilan Da<br>2. Dr. Elya Nus<br>3. Dr. Hartono   |
| DAG66963   | Biology Instructional Design                      |  |  |  |  |  |  | 2 |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70%  | 1.Prof. Dr. Ani<br>2.Dr. Masra La<br>3. Herinda Ma   |
| DAG62662   | Teaching Material Development in Biology Learning |  |  |  |  |  |  | 2 |  |  | 23,33 | 56 | L   | Exam Paper (200 Min)                              | 70%  | 1. Dr. Elya Nus<br>2. Dr. Lilan Da<br>3. Herinda Ma  |
| -          | Elected Courses                                   |  |  |  |  |  |  | 2 |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%  |  |
| -          | Elected Courses                                   |  |  |  |  |  |  | 2 |  |  | 23,33 | 56 | L/P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%  |  |

### 7<sup>th</sup> Semester

| Modul No.  | Title of Module / Course Unit        | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                 | weight of exam related to final grade |  |
|------------|--------------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|---|---------------------------------------|--|
|            |                                      | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   |                                       |  |
| UNG4260772 | Leadership                           |                            |   |   |   |   |   | 2 |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   | 1. Prof. Dr. An<br>2. Dr. Lilan Da   |
| UNG4261674 | Introduction to School Environment 2 |                            |   |   |   |   |   | 4 |   | 46,67          | 112              | P                            | Practical Exam (200 Min)                          | 100%                                  | 1. Prof. Dr. Hj.<br>2. Wirnangsi D<br>3. Prof. Dr. Ma<br>4. Abubakar S<br>5. Prof. Dr. No<br>6. Dra. Aryati<br>7. Dr. Lilan Da<br>8. Dr. Elya Nus<br>9. Dr. Hartono<br>10. Dr. Masra<br>11. Dr. Chairur<br>12. Dr. Frida M |
| UNG4261474 | Student Community Service            |                            |   |   |   |   |   | 4 |   | 46,67          | 112              | L                            | Study Report (200 Min)                            | 70%                                   | 1. Prof. Dr. Ma  |
| DAG67106   | Bachelor's Thesis                    |                            |   |   |   |   |   | 6 |   | 70,00          | 168              | S                            | Seminar, and thesis (200 menit)                   | 100%                                  | 1. Prof. Dr. Ma  |
| -          | Elected Courses                      |                            |   |   |   |   |   | 2 |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   |  |
| -          | Elected Courses                      |                            |   |   |   |   |   | 2 |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   |  |

### 8<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | weight of exam related to final grade |  |
|-----------|-------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|-----------------------------------|---------------------------------------|--|
|           |                               | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |                                       |  |

|          |                   |  |  |  |  |  |  |  |   |       |     |   |                                   |      |                 |
|----------|-------------------|--|--|--|--|--|--|--|---|-------|-----|---|-----------------------------------|------|-----------------|
| DAG67106 | Bachelor's Thesis |  |  |  |  |  |  |  | 6 | 70,00 | 168 | S | Seminar, and thesis (200<br>ment) | 100% | 1. Prof. Dr. Ma |
|----------|-------------------|--|--|--|--|--|--|--|---|-------|-----|---|-----------------------------------|------|-----------------|

|              |          |          |           |           |          |          |          |          |               |               |            |
|--------------|----------|----------|-----------|-----------|----------|----------|----------|----------|---------------|---------------|------------|
| <b>total</b> | <b>2</b> | <b>2</b> | <b>21</b> | <b>21</b> | <b>2</b> | <b>2</b> | <b>2</b> | <b>6</b> | <b>1680,0</b> | <b>4032,0</b> | <b>228</b> |
|              | <b>0</b> | <b>2</b> |           |           | <b>0</b> | <b>0</b> | <b>0</b> |          | <b>0</b>      | <b>0</b>      |            |

**L:**        **Lecture**  
**S:**        **Seminar**  
**T:**        **Tutorial**  
**P**         **Practice**

Table 24: Curriculum Bachelor of Chemistry Education

## Curriculum Overview

### Bachelor of Chemistry Education, 8 Semesters

#### 1<sup>st</sup> Semester

| Course No. | Title of Course       | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                  | weight of related to grade |
|------------|-----------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|--|----------------------------|
|            |                       | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |  |                            |
| NAS4460112 | Religion              | 2                          |   |   |   |   |   |   |   | 23,33          | 56,00            | L, P                         | Exam Paper (200 Min) and Practical Exam (200 Min)  | 70%                        |
| NAS4460212 | Pancasila             | 2                          |   |   |   |   |   |   |   | 23,33          | 56,00            | L                            | Exam Paper (200 min)                               | 70%                        |
| NAS4460412 | Bahasa Indonesia      | 2                          |   |   |   |   |   |   |   | 23,33          | 56,00            | L                            | Exam Paper (200 min)                               | 70%                        |
| UNG4460512 | Culture               | 2                          |   |   |   |   |   |   |   | 23,33          | 56,00            | L                            | Exam Paper (200 min)                               | 70%                        |
| DAJ60112   | Basic Chemistry 1     | 2                          |   |   |   |   |   |   |   | 23,33          | 56,00            | L                            | Exam Paper (200 min)                               | 70%                        |
| DAJ60311   | Basic Chemistry Lab 1 | 1                          |   |   |   |   |   |   |   |                | 39,67            | P                            | Exam Paper, Practical Exam, Final report (200 Min) | 70%                        |
| DAJ64112   | Calculus              | 2                          |   |   |   |   |   |   |   | 23,33          | 56,00            | L                            | Exam Paper (200 min)                               | 70%                        |
| DAJ64312   | Basic Physics         | 2                          |   |   |   |   |   |   |   | 23,33          | 56,00            | L, P                         | Exam Paper (200 Min), Practical Exam(200 Min)      | 70%                        |

|            |                           |   |  |  |  |  |  |  |  |  |       |       |     |   |     |
|------------|---------------------------|---|--|--|--|--|--|--|--|--|-------|-------|-----|---|-----|
| DAJ64212   | General Biology           | 2 |  |  |  |  |  |  |  |  | 23,33 | 56,00 | L,P | Exam Paper (200 Min) and Practical Exam (200 Min) | 70% |
| UNG4460612 | English                   | 2 |  |  |  |  |  |  |  |  | 23,33 | 56,00 | L   | Exam Paper (200 min)                              | 70% |
| UNG4460912 | Introduction to education | 2 |  |  |  |  |  |  |  |  | 23,33 | 56,00 | L   | Exam Paper (200 min)                              | 70% |

### 2<sup>nd</sup> Semester

| Course No. | Title of Course         | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | weight of related to grade                             |     |
|------------|-------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|-----------------------------------|--|-----|
|            |                         | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |  |     |
| NAS4460322 | Civics                  |                            | 2 |   |   |   |   |   |   |                | 23,33            | 56,00                        | L                                 | Exam paper (200 min)                                   | 70% |
| DAJ60222   | Basic chemistry 2       |                            | 2 |   |   |   |   |   |   |                | 23,33            | 56,00                        | L                                 | Exam Paper (200 Min)                                   | 70% |
| DAJ60421   | Basic chemistry lab 2   |                            | 1 |   |   |   |   |   |   |                |                  | 39,67                        | P                                 | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |
| DAJ61023   | Inorganic chemistry 1   |                            | 3 |   |   |   |   |   |   |                | 35,00            | 84,00                        | L                                 | Exam paper (200 min)                                   | 70% |
| DAJ61523   | Analytical chemistry    |                            | 3 |   |   |   |   |   |   |                | 35,00            | 84,00                        | L, P                              | Exam Paper, Practical Exam, Final report (200 Min)     | 70% |
| DAJ60523   | Organic chemistry 1     |                            | 3 |   |   |   |   |   |   |                | 35,00            | 84,00                        | L                                 | Exam paper (200 min)                                   | 70% |
| DAJ60821   | Organic chemistry Lab 1 |                            | 1 |   |   |   |   |   |   |                |                  | 39,67                        |                                   | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |



|            |                            |  |   |  |  |  |  |  |  |       |       |   |                      |     |
|------------|----------------------------|--|---|--|--|--|--|--|--|-------|-------|---|----------------------|-----|
| DAJ4461122 | Learning and Instructional |  | 2 |  |  |  |  |  |  | 23,33 | 56,00 | L | Exam paper (200 min) | 70% |
| UNG4461022 | Learner Development        |  | 2 |  |  |  |  |  |  | 23,33 | 56,00 | L | Exam paper (200 min) | 70% |
| UNG4461322 | Educational Profession     |  | 2 |  |  |  |  |  |  | 23,33 | 56,00 | L | Exam paper (200 min) | 70% |

### 3<sup>th</sup> Semester

| Course No. | Title of Course         | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                      | weight of related to grade |
|------------|-------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|--|----------------------------|
|            |                         | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |  |                            |
| DAJ61833   | Physical Chemistry 1    |                            |   | 3 |   |   |   |   |   | 35,00          | 84,00            | L, P                         | Exam Paper, Practical Exam, and Final report (200 Min) | 70%                        |
| DAJ62332   | Biochemistry 1          |                            |   | 2 |   |   |   |   |   | 23,33          | 56,00            | L                            | Exam paper (200 min)                                   | 70%                        |
| DAJ61133   | Inorganic Chemistry 2   |                            |   | 3 |   |   |   |   |   | 35,00          | 84,00            | L                            | Exam paper (200 min)                                   | 70%                        |
| DAJ61432   | Inorganic chemistry Lab |                            |   | 2 |   |   |   |   |   |                | 79,33            | P                            | Exam Paper, Practical Exam, and Final report (200 Min) | 70%                        |
| DAJ61633   | Separation chemistry    |                            |   | 3 |   |   |   |   |   | 35,00          | 84,00            | L, P                         | Exam Paper, Practical Exam, and Final report (200 Min) | 70%                        |

|           |                         |  |  |   |  |  |  |  |  |       |       |   |  |     |
|-----------|-------------------------|--|--|---|--|--|--|--|--|-------|-------|---|--|-----|
| DAJ60632  | Organic chemistry 2     |  |  | 2 |  |  |  |  |  | 23,33 | 56,00 | L | Exam paper (200 min)                                   | 70% |
| DAJ60931  | Organic chemistry Lab 2 |  |  | 1 |  |  |  |  |  |       | 39,67 | P | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |
| DAJ62232  | Radiochemistry          |  |  | 2 |  |  |  |  |  | 23,33 | 56,00 | L | Exam Paper (200 min)                                   | 70% |
| DAJ63632  | Statistic               |  |  | 2 |  |  |  |  |  | 23,33 | 56,00 | L | Exam Paper (200 min)                                   | 70% |
| DAA460532 | Philosophy of science   |  |  | 2 |  |  |  |  |  | 23,33 | 56,00 | L | Exam paper, Presentation (200 min)                     | 70% |

#### 4<sup>th</sup> Semester

| Course No. | Title of Course      | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                      | weight of related to grade |
|------------|----------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|--|----------------------------|
|            |                      | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |  |                            |
| DAJ61943   | Physical Chemistry 2 |                            |   |   | 3 |   |   |   |   | 35,00          | 84,00            | L, P                         | Exam Paper, Practical Exam, and Final report (200 Min) | 70%                        |
| DAJ62442   | Biochemistry 2       |                            |   |   | 2 |   |   |   |   | 23,33          | 56,00            | L                            | Exam paper, Presentation (200 min)                     | 70%                        |

|          |                       |  |  |  |   |  |  |  |  |       |       |      |  |     |
|----------|-----------------------|--|--|--|---|--|--|--|--|-------|-------|------|--|-----|
| DAJ62542 | Biochemistry Lab 2    |  |  |  | 2 |  |  |  |  |       | 79,33 | P    | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |
| DAJ61243 | Inorganic chemistry 3 |  |  |  | 3 |  |  |  |  | 35,00 | 84,00 | L, P | Exam paper, Presentation (200 min)                     | 70% |
| DAJ61743 | Instrument analytical |  |  |  | 3 |  |  |  |  | 35,00 | 84,00 | L, P | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |
| DAJ61743 | Organic chemistry 3   |  |  |  | 3 |  |  |  |  | 35,00 | 84,00 | L    | Exam paper, Presentation (200 min)                     | 70% |
| DAJ62043 | Chemical Bonding      |  |  |  | 3 |  |  |  |  | 35,00 | 84,00 | L    | Exam Paper, Presentation (200 min)                     | 70% |
| DAJ62843 | Research methodology  |  |  |  | 3 |  |  |  |  | 35,00 | 84,00 | L    | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |

### 5<sup>th</sup> Semester

| Course No. | Title of Course         | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations                      | weight of related to grade |
|------------|-------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|--|----------------------------|
|            |                         | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |  |                            |
| DAJ63452   | Computational chemistry |                            |   |   |   | 2 |   |   |   | 23,33          | 56,00            | L, P                         | Exam Paper, Practical Exam, and Final report (200 Min) | 70%                        |

|          |  |  |  |  |  |   |  |  |  |       |       |   |  |     |
|----------|--|--|--|--|--|---|--|--|--|-------|-------|---|--|-----|
| DAJ64652 | Waste Treatment  |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |
| DAJ64852 | Culinary Chemistry   |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Presentation (200 min)                     | 70% |
| DAJ64952 | Chemistry of Energy  |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Presentation (200 min)                     | 70% |
| DAJ65552 | Chemistry of Natural Product                                       |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Practical Exam, and Final report (200 Min) | 70% |
| DAJ63552 | Lab management   |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Presentation (200 min)                     | 70% |
| DAJ64752 | STEM Education   |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Seminar, Presentation (200 min)            | 70% |
| DAJ63052 | Capita Selecta Science   |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Presentation (200 min)                     | 70% |
| DAJ64452 | Technology and Media Educational science                           |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | L | Exam Paper, Presentation (200 min)                     | 70% |
| DAJ64552 | Overseas Teaching Field Experience (Microteaching PPL Luar Negeri) |  |  |  |  | 2 |  |  |  | 23,33 | 56,00 | P | Exam Paper, Practical Exam (200 min)                   | 70% |

### 6th Semester

| Course No. | Title of Course | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | weight of related to grade |  |
|------------|-----------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|------------------------------|-----------------------------------|----------------------------|--|
|            |                 | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |                            |  |
|            |                 |                            |   |   |   |   |   |   |   |                |                  |                              |                                   |                            |  |

|            |   |  |  |  |  |  |   |  |  |       |        |   |  |     |
|------------|---|--|--|--|--|--|---|--|--|-------|--------|---|--|-----|
| UNG4460862 | Entrepreneurship                            |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Exam Paper, Seminar, Presentation (200 min)      | 70% |
| UNG4460762 | Leadership                                  |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Exam Paper, Seminar, Presentation (200 min)      | 70% |
| UNG4461562 | Introduction to School Environment 1        |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Practical exam, Study Report (200 min)           | 70% |
| UNG4461664 | Introduction to School Environment 2        |  |  |  |  |  | 4 |  |  | 46,67 | 112,00 | L | Practical exam, Study Report (200 min)           | 70% |
| DAJ62762   | Chemistry Learning Strategy                 |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Exam Paper, Presentation, Study Report (200 min) | 70% |
| DAJ62962   | Learning Assesment                          |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Exam Paper, Presentation (200 min)               | 70% |
| DAJ63262   | Study of Curriculum and Chemistry Textbooks |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Exam Paper, Presentation, Study Report (200 min) | 70% |
| DAJ65062   | Problems in Teaching Chemistry              |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Exam Paper, Presentation, Study Report (200 min) | 70% |
| DAJ62662   | Plan in Learning Chemistry                  |  |  |  |  |  | 2 |  |  | 23,33 | 56,00  | L | Exam Paper, Presentation, Study Report (200 min) | 70% |

### 7th semester

| Course No. | Title of Course | Credit Points per Semester | Workload | Method of Teaching | Form and Duration of Examinations |
|------------|-----------------|----------------------------|----------|--------------------|-----------------------------------|
|------------|-----------------|----------------------------|----------|--------------------|-----------------------------------|

|            |                           | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   | weight of related to grade |
|------------|---------------------------|---|---|---|---|---|---|---|---|----------------|------------------|------------------------------|---|----------------------------|
| UNG4461404 | Student Community Service |   |   |   |   |   |   | 4 |   | 46,67          | 112,00           | L                            | Study report, Final Report (200 min)          | 70%                        |
|            | Elective Course           |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | exam paper (200 min)                          | 70%                        |
|            | Elective Course           |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | exam paper (200 min)                          | 70%                        |
|            | Elective Course           |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | exam paper (200 min)                          | 70%                        |
|            | Elective Course           |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | exam paper (200 min)                          | 70%                        |
|            | Bachelor's Thesis*        |   |   |   |   |   |   | 6 |   | 70,00          | 168,00           | S                            | Seminar, Presentation, Final Report (200 min) | 100%                       |

### 8th semester

| Course No.   | Title of Course    | Credit Points per Semester |           |           |           |           |           |           |          | Workload       |                  | Method of Teaching           | Form and Duration of Examinations             | weight of related to grade |
|--------------|--------------------|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------------|------------------|------------------------------|---|----------------------------|
|              |                    | 1                          | 2         | 3         | 4         | 5         | 6         | 7         | 8        | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |   |                            |
|              | Bachelor's Thesis* |                            |           |           |           |           |           |           | 6*       | 70,00*         | 168,00           | S                            | Seminar, Presentation, Final Report (200 min) | 100%                       |
| <b>Total</b> |                    | <b>21</b>                  | <b>21</b> | <b>22</b> | <b>22</b> | <b>20</b> | <b>20</b> | <b>14</b> | <b>6</b> | <b>1610,00</b> | <b>4181,33</b>   |                              |   |                            |

**L:**        *Lecture*  
**S:**        *Seminar*  
**T:**        *Tutorial*  
**P:**        *Practice*

| Course No. | Elective Course | Credit Points per Semester | Workload | Method of Teaching | Form and Duration of Examinations |  |
|------------|-----------------|----------------------------|----------|--------------------|-----------------------------------|--|
|------------|-----------------|----------------------------|----------|--------------------|-----------------------------------|--|

|          |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                    | weight of related to grade |
|----------|--|---|---|---|---|---|---|---|---|----------------|------------------|------------------------------|------------------------------------|----------------------------|
| DAJ65172 | Chemistry for vocational high school*                |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | Exam Paper, Presentation (200 min) | 70%                        |
| DAJ65272 | Chemistry for high school*                           |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | Exam Paper, Presentation (200 min) | 70%                        |
| DAJ65372 | Introduction to Biotechnology*                       |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | Exam Paper, Presentation (200 min) | 70%                        |
| DAJ65572 | Toxicological chemistry*                             |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | Exam Paper, Presentation (200 min) | 70%                        |
| DAJ65472 | Innovative chemistry learning*                       |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | Exam Paper, Presentation (200 min) | 70%                        |
| DAJ65672 | Technology and informatics in chemistry learning*    |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | Exam Paper, Presentation (200 min) | 70%                        |
| DAJ65772 | Development of learning media based on local wisdom* |   |   |   |   |   |   | 2 |   | 23,33          | 56,00            | L                            | Exam Paper, Presentation (200 min) | 70%                        |

|          |  |  |  |  |  |  |  |   |  |       |       |   |                                    |     |
|----------|--|--|--|--|--|--|--|---|--|-------|-------|---|------------------------------------|-----|
| DAJ65872 | Development of chemistry teaching material for senior high school* |  |  |  |  |  |  | 2 |  | 23,33 | 56,00 | L | Exam Paper, Presentation (200 min) | 70% |
| DAJ66172 | Environmental chemistry*   |  |  |  |  |  |  | 2 |  | 23,33 | 56,00 | L | Exam Paper, Presentation (200 min) | 70% |
| DAJ65972 | Food chemistry*  |  |  |  |  |  |  | 2 |  | 23,33 | 56,00 | L | exam paper (200 min)               | 70% |



Table 25: Curriculum Bachelor of Physics Education



## Curriculum Overview

### Bachelor of Physics Education, 8 Semesters

#### 1<sup>st</sup> Semester

| Modul No. | Title of Module / Course Unit | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                     | Method of Teaching<br>i.e. lecture course,<br>seminar | Form and Duration of<br>Examinations | Weight of<br>Exam<br>Related to<br>Final Grade |
|-----------|-------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|---------------------|---|--------------------------------------|--|
|           |                               | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours<br>Self-Study |   |                                      |  |
|           |                               | 20                         |   |   |   |   |   |   |   | 233,33         | 560                 |   |                                      |  |
| NAS60112  | Religion                      | 2                          |   |   |   |   |   |   |   | 23,33          | 56                  | L   | Exam Paper (200 Min)                 | 70%  |
| NAS60212  | Pancasila                     | 2                          |   |   |   |   |   |   |   | 23,33          | 56                  | L   | Exam Paper (200 Min)                 | 70%  |
| NAS60412  | Bahasa Indonesia              | 2                          |   |   |   |   |   |   |   | 23,33          | 56                  | L   | Exam Paper (200 Min)                 | 70%  |
| DAA60113  | Calculus I                    | 3                          |   |   |   |   |   |   |   | 35,00          | 84                  | L   | Exam Paper (200 Min)                 | 70%  |
| DAA60213  | Basic Physics I               | 3                          |   |   |   |   |   |   |   | 35,00          | 84                  | L   | Exam Paper (200 Min)                 | 70%  |
| DAE60311  | Practical of Basic Physics I  | 1                          |   |   |   |   |   |   |   | 11,67          | 28                  | P   | Practical Exam (200 Min)             | 70%  |
| DAA60414  | Basic Chemistry               | 4                          |   |   |   |   |   |   |   | 46,67          | 112                 | P   | Practical Exam (200 Min)             | 70%  |
| DAA60513  | General Biology               | 3                          |   |   |   |   |   |   |   | 35,00          | 84                  | P   | Practical Exam (200 Min)             | 70%  |

#### 2<sup>nd</sup> Semester

| Modul No. | Title of Module / Course Unit | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                     | Method of Teaching<br>i.e. lecture course,<br>seminar | Form and Duration of<br>Examinations | Weight of<br>Exam<br>Related to<br>Final Grade |
|-----------|-------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|---------------------|---|--------------------------------------|--|
|           |                               | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours<br>Self-Study |   |                                      |  |

|          |                               |  |    |  |  |  |  |  |  |        |     |   |                          |     |      |
|----------|-------------------------------|--|----|--|--|--|--|--|--|--------|-----|---|--------------------------|-----|------|
|          |                               |  | 22 |  |  |  |  |  |  | 256,67 | 616 |   |                          |     |      |
| NAS60322 | Civics                        |  | 2  |  |  |  |  |  |  | 23,33  | 56  | L | Exam Paper (200 Min)     | 70% | 1.2. |
| UNG60622 | Applied English               |  | 2  |  |  |  |  |  |  | 23,33  | 56  | L | Exam Paper (200 Min)     | 70% | 1.2. |
| UNG61022 | Learner Development           |  | 2  |  |  |  |  |  |  | 23,33  | 56  | L | Exam Paper (200 Min)     | 70% | 1.2. |
| DAE60623 | Calculus II                   |  | 3  |  |  |  |  |  |  | 35,00  | 84  | L | Exam Paper (200 Min)     | 70% | 1.2. |
| DAE60723 | Basic Physics II              |  | 3  |  |  |  |  |  |  | 35,00  | 84  | L | Exam Paper (200 Min)     | 70% | 1.2. |
| DAE60821 | Practical of Basic Physics II |  | 1  |  |  |  |  |  |  | 11,67  | 28  | P | Practical Exam (200 Min) | 70% | 1.2. |
| DAE60923 | Mechanics                     |  | 3  |  |  |  |  |  |  | 35,00  | 84  | L | Exam Paper (200 Min)     | 70% | 1.2. |
| DAE61023 | Basic Statistics              |  | 3  |  |  |  |  |  |  | 35,00  | 84  | L | Exam Paper (200 Min)     | 70% | 1.2. |
| DAE61123 | Basic Electronics             |  | 3  |  |  |  |  |  |  | 35,00  | 84  | P | Practical Exam (200 Min) | 70% | 1.2. |

### 3<sup>rd</sup> Semester

| Modul No. | Title of Module / Course Unit | Credit Points per Semester |   |    |   |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | Weight of Exam Related to Final Grade |
|-----------|-------------------------------|----------------------------|---|----|---|---|---|---|---|----------------|------------------|------------------------------|-----------------------------------|---------------------------------------|
|           |                               | 1                          | 2 | 3  | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |                                       |
|           |                               |                            |   | 20 |   |   |   |   |   | 233,33         | 560              |                              |                                   |                                       |
| UNG60532  | Culture                       |                            |   | 2  |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)              | 70%                                   |
| DAA61232  | Philosophy of Science         |                            |   | 2  |   |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)              | 70%                                   |
| DAE61334  | Mathematics Physics I         |                            |   | 4  |   |   |   |   |   | 46,67          | 112              | L                            | Exam Paper (200 Min)              | 70%                                   |
| DAE61433  | Physics Laboratory            |                            |   | 3  |   |   |   |   |   | 35,00          | 84               | P                            | Practical Exam (200 Min)          | 70%                                   |
| DAE61534  | Modern Physics                |                            |   | 4  |   |   |   |   |   | 46,67          | 112              | L                            | Exam Paper (200 Min)              | 70%                                   |

|          |                 |  |  |   |  |  |  |  |  |       |    |   |                          |     |          |
|----------|-----------------|--|--|---|--|--|--|--|--|-------|----|---|--------------------------|-----|----------|
| DAE61633 | Thermodynamics  |  |  | 3 |  |  |  |  |  | 35,00 | 84 | P | Practical Exam (200 Min) | 70% | 1.<br>2. |
| -        | Elected Courses |  |  | 2 |  |  |  |  |  | 23,33 | 56 | L | Exam Paper (200 Min)     | 70% |          |

#### 4<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit  | Credit Points per Semester |   |   |    |   |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | Weight of Exam Related to Final Grade |           |  |
|-----------|--------------------------------|----------------------------|---|---|----|---|---|---|---|----------------|------------------|------------------------------|-----------------------------------|---------------------------------------|-----------|--|
|           |                                | 1                          | 2 | 3 | 4  | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |                                       |           |  |
|           |                                |                            |   |   | 21 |   |   |   |   | 245,00         | 588              |                              |                                   |                                       |           |  |
| DAE61744  | Mathematics Physics II         |                            |   |   | 4  |   |   |   |   | 46,67          | 112              | L                            | Exam Paper (200 Min)              | 70%                                   | 1.<br>2.  |  |
| DAE61844  | Waves and Optics               |                            |   |   | 4  |   |   |   |   | 46,67          | 112              | P                            | Practical Exam (200 Min)          | 70%                                   | 1.<br>Dr. |  |
| DAE61944  | Magnetic Electric              |                            |   |   | 4  |   |   |   |   | 46,67          | 112              | L                            | Exam Paper (200 Min)              | 70%                                   | 1.<br>Me  |  |
| DAE62042  | Capita Selecta School Physics  |                            |   |   | 2  |   |   |   |   | 23,33          | 56               | P                            | Practical Exam (200 Min)          | 70%                                   | 1.<br>Cit |  |
| DAE62143  | Physics Learning Research      |                            |   |   | 3  |   |   |   |   | 35,00          | 84               | P                            | Practical Exam (200 Min)          | 70%                                   | 1.<br>2.  |  |
| DAE62242  | Physics Educational Profession |                            |   |   | 2  |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)              | 70%                                   | 1.<br>2.  |  |
| -         | Elected Courses                |                            |   |   | 2  |   |   |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)              | 70%                                   |           |  |

#### 5<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit | Credit Points per Semester |   |   |   |    |   |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | Weight of Exam Related to Final Grade |           |  |
|-----------|-------------------------------|----------------------------|---|---|---|----|---|---|---|----------------|------------------|------------------------------|-----------------------------------|---------------------------------------|-----------|--|
|           |                               | 1                          | 2 | 3 | 4 | 5  | 6 | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |                                       |           |  |
|           |                               |                            |   |   |   | 19 |   |   |   | 221,67         | 532              |                              |                                   |                                       |           |  |
| DAE62353  | Quantum Physics               |                            |   |   |   | 3  |   |   |   | 35,00          | 84               | L                            | Exam Paper (200 Min)              | 70%                                   | 1.<br>Dr. |  |
| DAE62453  | Multimedia                    |                            |   |   |   | 3  |   |   |   | 35,00          | 84               | L                            | Exam Paper (200 Min)              | 70%                                   | 1.<br>2.  |  |

|          |                             |  |  |  |  |   |  |  |  |       |    |   |                          |     |          |
|----------|-----------------------------|--|--|--|--|---|--|--|--|-------|----|---|--------------------------|-----|----------|
| DAE63283 | Statistical Physics         |  |  |  |  | 3 |  |  |  | 35,00 | 84 | L | Exam Paper (200 Min)     | 70% | 1. Dr.   |
| DAE63383 | Introduction Core Physics   |  |  |  |  | 3 |  |  |  | 35,00 | 84 | L | Exam Paper (200 Min)     | 70% | 1. 2.    |
| DAE63483 | Introduction Solids Physics |  |  |  |  | 3 |  |  |  | 35,00 | 84 | P | Practical Exam (200 Min) | 70% | 1. 2. 3. |
| -        | Elected Courses             |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L | Exam Paper (200 Min)     | 70% |          |
| -        | Elected Courses             |  |  |  |  | 2 |  |  |  | 23,33 | 56 | L | Exam Paper (200 Min)     | 70% |          |

### 6<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit             | Credit Points per Semester |   |   |   |   |    |   |   | Workload       |                  | Method of Teaching           | Form and Duration of Examinations | Weight of Exam Related to Final Grade |          |  |
|-----------|---|----------------------------|---|---|---|---|----|---|---|----------------|------------------|------------------------------|-----------------------------------|---------------------------------------|----------|--|
|           |   | 1                          | 2 | 3 | 4 | 5 | 6  | 7 | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar |                                   |                                       |          |  |
|           |   |                            |   |   |   |   | 20 |   |   | 233,33         | 560              |                              |                                   |                                       |          |  |
| UNG61562  | Introduction to School Environment 1      |                            |   |   |   |   | 2  |   |   | 23,33          | 56               | P                            | Project Essay                     | 100%                                  | 1.       |  |
| UNG61664  | Introduction to School Environment 2      |                            |   |   |   |   | 4  |   |   | 46,67          | 112              | P                            | Project Essay                     | 100%                                  | 1.       |  |
| DAE62563  | Physics Learning Assessment               |                            |   |   |   |   | 3  |   |   | 35,00          | 84               | P                            | Practical Exam (200 Min)          | 70%                                   | 1. 2.    |  |
| DAE62663  | Physics Learning and Instruction          |                            |   |   |   |   | 3  |   |   | 35,00          | 84               | L                            | Exam Paper (200 Min)              | 70%                                   | 1. 2.    |  |
| DAE62762  | Physics Teaching and Learning Interaction |                            |   |   |   |   | 2  |   |   | 23,33          | 56               | L                            | Exam Paper (200 Min)              | 70%                                   | 1. 2.    |  |
| DAE62863  | Physics Lesson Planning                   |                            |   |   |   |   | 3  |   |   | 35,00          | 84               | L                            | Exam Paper (200 Min)              | 70%                                   | 1. 2. 3. |  |
| DAE62963  | Study Physics Curriculum and Textbooks    |                            |   |   |   |   | 3  |   |   | 35,00          | 84               | L                            | Exam Paper (200 Min)              | 70%                                   | 1. 2.    |  |

### 7<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit | Credit Points per Semester |  |  |  |  |  |  |  | Workload |  | Method of Teaching |  |  |  |
|-----------|-------------------------------|----------------------------|--|--|--|--|--|--|--|----------|--|--------------------|--|--|--|
|-----------|-------------------------------|----------------------------|--|--|--|--|--|--|--|----------|--|--------------------|--|--|--|

|          |                                      | 1 | 2 | 3 | 4 | 5 | 6 | 7  | 8 | Hours in Class | Hours Self-Study | i.e. lecture course, seminar | Form and Duration of Examinations                 | Weight of Exam Related to Final Grade |
|----------|--------------------------------------|---|---|---|---|---|---|----|---|----------------|------------------|------------------------------|---|---------------------------------------|
|          |                                      |   |   |   |   |   |   |    |   |                |                  |                              |   |                                       |
|          |                                      |   |   |   |   |   |   | 22 |   | 256,67         | 616              |                              |   |                                       |
| UNG60772 | Leadership                           |   |   |   |   |   |   | 2  |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   |
| UNG60872 | Entrepreneurship                     |   |   |   |   |   |   | 2  |   | 23,33          | 56               | L/P                          | Exam Paper (200 Min) and Practical Exam (200 Min) | 70%                                   |
| UNG61404 | Student Community Service            |   |   |   |   |   |   | 4  |   | 46,67          | 112              | P                            | Project Essay                                     | 100%                                  |
| DAE63072 | Physics Measurement Tools            |   |   |   |   |   |   | 2  |   | 23,33          | 56               | P                            | Practical Exam (200 Min)                          | 70%                                   |
| DAE63172 | School Physics Laboratory Management |   |   |   |   |   |   | 2  |   | 23,33          | 56               | P                            | Practical Exam (200 Min)                          | 70%                                   |
| DAE63506 | Bachelor's Thesis                    |   |   |   |   |   |   | 6  |   | 70,00          | 168              | S                            | Thesis/Presentation                               | 100%                                  |
| -        | Elected Courses                      |   |   |   |   |   |   | 2  |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   |
| -        | Elected Courses                      |   |   |   |   |   |   | 2  |   | 23,33          | 56               | L                            | Exam Paper (200 Min)                              | 70%                                   |

### 8<sup>th</sup> Semester

| Modul No. | Title of Module / Course Unit | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching | Form and Duration of Examinations | Weight of Exam Related to Final Grade |
|-----------|-------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|--------------------|-----------------------------------|---------------------------------------|
|           |                               | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study |                    |                                   |                                       |
|           |                               |                            |   |   |   |   |   |   |   | 70             | 168              |                    |                                   |                                       |
| DAE63506  | Bachelor's Thesis             |                            |   |   |   |   |   | 6 |   | 70,00          | 168              | S                  | Thesis/Presentation               | 100%                                  |

|              |           |           |           |           |           |           |           |          |                |                |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------------|----------------|
| <b>Total</b> | <b>20</b> | <b>22</b> | <b>20</b> | <b>21</b> | <b>19</b> | <b>20</b> | <b>16</b> | <b>6</b> | <b>1680,00</b> | <b>4032,00</b> |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------------|----------------|

|                |               |
|----------------|---------------|
| <b>5712,00</b> | <b>228,48</b> |
|----------------|---------------|

**L:**        *Lecture*  
**S:**        *Seminar*  
**T:**        *Tutorial*  
**P**         *Practice*

Table 26: Curriculum Bachelor of Geography Education

**Curriculum Overview**  
**Bachelor of Geography Education, 8 Semesters**

| Module No. | Title of Module / Course Unit  | Credit Points per Semester |   |   |   |   |   |   |   | Workload       |                  | Method of Teaching<br>i.e. Lecture courses, seminars, tutorial, practice | Form and Duration Examinations |
|------------|--------------------------------|----------------------------|---|---|---|---|---|---|---|----------------|------------------|--|--------------------------------|
|            |                                | 1                          | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Hours in Class | Hours Self-Study |  |                                |
|            | <b>1<sup>st</sup> Semester</b> |                            |   |   |   |   |   |   |   |                |                  |  |                                |
| NAS4560112 | Religion                       | 2                          |   |   |   |   |   |   |   | 23,3           | 56,0             | L  | Exam Paper (200 Min)           |
| NAS4560312 | Civics                         | 2                          |   |   |   |   |   |   |   | 23,3           | 56,0             | L  | Exam Paper (200 Min)           |
| UNG4560512 | Culture                        | 2                          |   |   |   |   |   |   |   | 23,3           | 56,0             | L  | Exam Paper (200 Min)           |
| UNG4560912 | Introduction to Education      | 2                          |   |   |   |   |   |   |   | 23,3           | 56,0             | L  | Exam Paper (200 Min)           |
| DAL60112   | Introduction to Geography      | 2                          |   |   |   |   |   |   |   | 23,3           | 56,0             | L  | Exam Paper (200 Min)           |

|            |                                |   |   |  |  |  |  |  |      |      |     |   |
|------------|--------------------------------|---|---|--|--|--|--|--|------|------|-----|---|
| DAL60212   | General Geology                | 2 |   |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL60312   | General Geomorphology          | 2 |   |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAA560112  | Calculus                       | 2 |   |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAA560412  | Basic Chemistry                | 2 |   |  |  |  |  |  | 23,3 | 56,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAA560312  | Basic Physics                  | 2 |   |  |  |  |  |  | 23,3 | 56,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAA560212  | General Biology                | 2 |   |  |  |  |  |  | 23,3 | 56,0 | L/P | Exam Paper and Practical Exam (200 Min) |
|            |                                |   |   |  |  |  |  |  |      |      |     |   |
|            | <b>2<sup>nd</sup> Semester</b> |   |   |  |  |  |  |  |      |      |     |   |
| NAS4560222 | Pancasila                      |   | 2 |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| NAS4560422 | Bahasa Indonesia               |   | 2 |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| UNG4561022 | Learner Development            |   | 2 |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |

|            |                                       |  |   |  |  |  |  |  |      |      |     |   |
|------------|---------------------------------------|--|---|--|--|--|--|--|------|------|-----|---|
| DAA560522  | Science phylosophy                    |  | 2 |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| UNG4561123 | Learning and Instruction              |  | 3 |  |  |  |  |  | 35,0 | 84,0 | L   | Exam Paper (200 Min)                    |
| DAL60923   | Soil Geography                        |  | 3 |  |  |  |  |  | 35,0 | 84,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAL61123   | Basic Statistics                      |  | 3 |  |  |  |  |  | 35,0 | 84,0 | L   | Exam Paper (200 Min)                    |
| DAL62123   | Meteorology and Climatology           |  | 3 |  |  |  |  |  | 35,0 | 84,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| UNG4561322 | Educational Profession                |  | 2 |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
|            |                                       |  |   |  |  |  |  |  |      |      |     |   |
|            | <b>3<sup>rd</sup> Semester</b>        |  |   |  |  |  |  |  |      |      |     |   |
| DAL60833   | Hydrology                             |  | 3 |  |  |  |  |  | 35,0 | 84,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAL61432   | Population Geography and Demographics |  | 2 |  |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |



|          |                                      |  |  |   |  |  |  |  |      |      |     |   |
|----------|--------------------------------------|--|--|---|--|--|--|--|------|------|-----|---|
| DAL63233 | Geographical Research Methods        |  |  | 3 |  |  |  |  | 35,0 | 84,0 | L   | Exam Paper and Practical Exam (200 Min) |
| DAL61632 | Agricultural Geography               |  |  | 2 |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL61732 | Indonesian Geology and Geomorphology |  |  | 2 |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL61833 | Cartography                          |  |  | 2 |  |  |  |  | 23,3 | 56,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAL61932 | Urban Village Geography              |  |  | 2 |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL61032 | Resource Geography                   |  |  | 2 |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL62032 | Transportation Geography             |  |  | 2 |  |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
|          |                                      |  |  |   |  |  |  |  |      |      |     |   |
|          | <b>4<sup>th</sup> Semester</b>       |  |  |   |  |  |  |  |      |      |     |   |
| DAL64343 | Geographic Information System        |  |  | 3 |  |  |  |  | 35,0 | 84,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAL62243 | Geography Learning Strategy          |  |  | 3 |  |  |  |  | 35,0 | 84,0 | L   | Exam Paper (200 Min)                    |

|          |                                 |  |  |  |   |  |  |  |      |      |     |   |
|----------|---------------------------------|--|--|--|---|--|--|--|------|------|-----|---|
| DAL62343 | Geography Learning Assessment   |  |  |  | 3 |  |  |  | 35,0 | 84,0 | L   | Exam Paper (200 Min)                    |
| DAL63043 | Geography Learning Planning     |  |  |  | 3 |  |  |  | 35,0 | 84,0 | L   | Exam Paper (200 Min)                    |
| DAL62542 | Economic Geography              |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL62643 | Remote Sensing                  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAL62842 | Environmental Geography         |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL63442 | Regional Geography of Indonesia |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL61241 | Scientific Writing              |  |  |  | 1 |  |  |  | 11,7 | 28,0 | L   | Exam Paper (200 Min)                    |

| 5 <sup>th</sup> Semester |                                   |  |  |  |  |   |  |  |  |      |      |     |   |
|--------------------------|-----------------------------------|--|--|--|--|---|--|--|--|------|------|-----|---|
| UNG4560652               | Applied English                   |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL64552                 | Land Conservation and Reclamation |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL61352                 | Biogeography                      |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL63552                 | Oceanography                      |  |  |  |  | 3 |  |  |  | 35,0 | 84,0 | L/P | Exam Paper and Practical Exam (200 Min) |
| DAL63152                 | Disaster Geography                |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
| DAL62952                 | Socio-Cultural Geography          |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
|                          | Elected Course*                   |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
|                          | Elected Course*                   |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
|                          | Elected Course*                   |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |
|                          | Elected Course*                   |  |  |  |  | 2 |  |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)                    |

| 6 <sup>th</sup> Semester |  |  |  |  |  |  |   |  |  |      |      |     |                          |
|--------------------------|--|--|--|--|--|--|---|--|--|------|------|-----|--------------------------|
| UNG4560762               | Leadership                                   |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)     |
| UNG4561562               | Introduction to School Environment 1         |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | T/P | Practical Exam (200 Min) |
| DAL64762                 | Field Work Practice                          |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | T/P | Study Report (200 M      |
| DAL63362                 | Study the Curriculum and Geography Textbooks |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)     |
| DAL62462                 | Geography Learning Media                     |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)     |
| DAL63762                 | Education Management                         |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)     |
| DAL65162                 | Development of Teaching Materials            |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)     |
| DAL64862                 | Learning Technologies                        |  |  |  |  |  | 2 |  |  | 23,3 | 56,0 | L   | Exam Paper (200 Min)     |

|            |   |  |  |  |  |   |   |  |      |       |     |                                     |
|------------|---|--|--|--|--|---|---|--|------|-------|-----|-------------------------------------|
| DAL65062   | Classroom Action Research                   |  |  |  |  | 2 |   |  | 23,3 | 56,0  | L   | Exam Paper (200 Min)                |
|            | Elected Course*                             |  |  |  |  | 2 |   |  | 23,3 | 56,0  | L   | Exam Paper (200 Min)                |
|            | Elected Course*                             |  |  |  |  | 2 |   |  | 23,3 | 56,0  | L   | Exam Paper (200 Min)                |
|            |   |  |  |  |  |   |   |  |      |       |     |                                     |
|            | <b>7<sup>th</sup> Semester</b>              |  |  |  |  |   |   |  |      |       |     |                                     |
| UNG4561674 | Introduction to School Environment 2        |  |  |  |  | 4 |   |  | 46,7 | 112,0 | T/P | Practical Exam (200 Min)            |
| UNG4561404 | Student Community Service                   |  |  |  |  |   | 4 |  | 46,7 | 112,0 | P   | Study Report (200 Min)              |
| UNG4560872 | Entrepreneurship                            |  |  |  |  |   | 2 |  | 23,3 | 56,0  | P   | Exam Paper (200 Min)                |
| DAL64272   | Environmental Impact Assessment             |  |  |  |  |   | 2 |  | 23,3 | 56,0  | L   | Exam Paper (200 Min)                |
| DAL63672   | Development Geography and Regional Planning |  |  |  |  |   | 2 |  | 23,3 | 56,0  | L   | Exam Paper (200 Min)                |
| DAL65206   | Undergraduate Thesis                        |  |  |  |  |   | 6 |  | 70,0 | 168,0 | S   | Thesis Report and Seminar (200 Min) |
|            |   |  |  |  |  |   |   |  |      |       |     |                                     |

| 8 <sup>th</sup> Semester |                      |           |           |           |           |           |           |           |          |              |              |               |                                     |
|--------------------------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|--------------|--------------|---------------|-------------------------------------|
| DAL65206                 | Undergraduate Thesis |           |           |           |           |           |           |           | 6        | 70,0         | 168,0        | S             | Thesis Report and Seminar (200 Min) |
|                          | Publication          | 0         |           |           |           |           |           |           |          | 0,0          | 0,0          |               | 0,0                                 |
| <b>TOTAL</b>             |                      | <b>22</b> | <b>22</b> | <b>20</b> | <b>21</b> | <b>21</b> | <b>16</b> | <b>16</b> | <b>6</b> | <b>#####</b> | <b>#####</b> | <b>228,48</b> |                                     |

*L: Lecture*  
*S: Seminar*  
*T: Tutorial*  
*P Practice*

#### ELECTIVE COURSE

|          |                           |  |  |  |  |  |  |   |  |      |      |   |                      |
|----------|---------------------------|--|--|--|--|--|--|---|--|------|------|---|----------------------|
| DAL63952 | Mineralogy dan Petrology* |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Min) |
| DAL64952 | Industrial Geography*     |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Min) |
| DAL64652 | Tourism Geography*        |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Min) |
| DAL64052 | Digital Image Processing* |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Min) |

|          |  |  |  |  |  |  |  |   |  |      |      |   |                    |
|----------|--|--|--|--|--|--|--|---|--|------|------|---|--------------------|
| DAL64152 | Thematic Cartography*                  |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL63852 | Antropology*                           |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL62752 | Cosmography *                          |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL64452 | World Regional Geography *             |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL65462 | Land Resource Evaluation*              |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL65562 | Political Geography*                   |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL65662 | Applied Geographic Information System* |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL65762 | Problem Based Learning*                |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL65862 | Environmental Modeling*                |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |
| DAL65962 | Hydrogeology*                          |  |  |  |  |  |  | 2 |  | 23,3 | 56,0 | L | Exam Paper (200 Mi |

**Table 27: Sample Laboratory Equipment Pool – Osnabrück University – Department of Biology**

| Item (English)                   | Item (German)                              | Quantity <sup>30</sup> |
|----------------------------------|--|------------------------|
| Gilson pipette P2                | Gilson Pipette P2                          | 30                     |
| Gilson pipette P20               | Gilson Pipette P20                         | 92                     |
| Gilson pipette P100              | Gilson Pipette P100                        | 4                      |
| Gilson pipette P200              | Gilson Pipette P200                        | 90                     |
| Gilson pipette P1000             | Gilson Pipette P1000                       | 85                     |
| lace boxes (yellow)              | Spitzenkästen (gelb)                       | 30                     |
| lace boxes (blue)                | Spitzenkästen (blau)                       | 30                     |
| Pipette controller               | Pipettierhelfer                            | 82                     |
| tube rack with white nylon cover | Reagenzglasgestell mit weißem Nylonüberzug | 21                     |
| Stainless steel tube rack        | Reagenzglasgestell aus Edelstahl           | 40                     |
| Plastic tube rack                | Reagenzglasgestell aus Kunststoff          | 7                      |
| Stopwatch                        | Stoppuhr                                   | 100                    |
| timer                            | Kurzzeitmesser                             | 34                     |
| tube shaker "Vortex" (REAX)      | Reagenzglasschüttler "Vortex" (REAX)       | 42                     |
| magnetic stirrer without heating | Magnetrührer ohne Heizung                  | 13                     |
| magnetic stirrer with heating    | Magnetrührer mit Heizung                   | 7                      |

<sup>30</sup> 140 students per year



|  |                                       |    |
|--|---------------------------------------|----|
| immersion thermostat (Ecoline E 100)       | Einhängethermostat (Ecoline E 100)    | 20 |
| Bath vessel (13l) for immersion thermostat | Badgefäß (13l) für Einhängethermostat | 10 |
| Water bath (22l, up to 100°C)              | Wasserbad (22l, bis 100°C)            | 8  |
| water tank big                             | Wasserbad groß                        | 1  |
| Reaction vessel stand                      | Reaktionsgefäßeständer                | 54 |
| Precision scale (up to 1500 g)             | Präzisionswaage (bis 1500 g)          | 7  |
| Horizontal gel system                      | Horizontal-Gelsystem                  | 12 |
| Consort Power Supply                       | Consort Power Supply                  | 5  |
| Thermocycler (Peqlab)                      | Thermocycler (Peqlab)                 | 1  |
| Microcentrifuge (Hettich, Eppendorf)       | Mikrozentrifuge (Hettich, Eppendorf)  | 5  |
| Waste disposal bag stand                   | Entsorgungsbeutelständer              | 15 |
| Cuvette stand                              | Küvettenständer                       | 35 |
| Ice boxes                                  | Eisboxen                              | 9  |
| Bunsen burner+safety tubes                 | Bunsenbrenner+Sicherheitsschläuche    | 20 |
| Spectrophotometer VIS Libra S6             | Spektralphotometer VIS Libra S6       | 15 |
| Spectral Thermometer VIS (Spectronic)      | Spektralthermometer VIS (Spectronic)  | 6  |
| Spectral Thermometer UV/VIS (Thermo)       | Spektralthermometer UV/VIS            | 2  |

|  |   |    |
|--|---|----|
| Spectronic)                                | (Thermo Spectronic)                         |    |
| Shaking water bath + platform on trolley   | Schüttelwasserbad + Plattform auf Rollwagen | 4  |
| Retaining clips for 125 ml flasks          | Halteklammern für 125 ml Kolben             | 60 |
| Retaining clips for 250 ml flasks          | Halteklammern für 250 ml Kolben             | 26 |
| Retaining clips for 500 ml flasks          | Halteklammern für 500 ml Kolben             | 8  |
| Retaining clips for 1000 ml flasks         | Halteklammern für 1000 ml Kolben            | 4  |
| Brutschrank                                | Brutschrank                                 | 1  |
| Power Supply (GE Healthcare)               | Power Supply (GE Healthcare)                | 3  |
| SDS-PAGE running chamber with lid (Hoefer) | SDS-PAGE Laufkammer mit Deckel (Hoefer)     | 12 |
| Gel casting stand for 2 gels (Hoefer)      | Gelgießstand für 2 Gele (Hoefer)            | 12 |
| Gel casting chamber for 10 gels (Hoefer)   | Gelgießkammer für 10 Gele (Hoefer)          | 2  |
| Glass plates 10 x 8 cm (Hoefer)            | Glasplatten 10 x 8 cm (Hoefer)              | 62 |
| Ceramic plates 10 x 8 cm (Hoefer)          | Keramikplatten 10 x 8 cm (Hoefer)           | 31 |
| Red brackets (Hoefer)                      | Rote Klammern (Hoefer)                      | 28 |
| combs (10 wells, 0.75 mm, for Hoefer)      | Kämme (10 Well, 0.75 mm, für Hoefer)        | 13 |

|   |   |    |
|---|---|----|
| combs (10 wells, 0.75 mm, for Hoefer)             | Kämme (10 Well, 1.0 mm, für Hoefer)                 | 30 |
| Spacer (0.75 mm, for Hoefer)                      | Spacer (0.75 mm, für Hoefer)                        | 18 |
| Spacer (1.0 mm, for Hoefer)                       | Spacer (1.0 mm, für Hoefer)                         | 60 |
| Hamilton syringe (25 µl)                          | Hamilton-Spritze (25 µl)                            | 4  |
| microwave   | Mikrowelle  | 1  |
| Computer (Dell, plus keyboard, mouse and monitor) | Computer (Dell, plus Tastatur, Maus und Bildschirm) | 1  |
| printer   | Drucker (Dell)                                      | 1  |
| Hansa lights (for light-dark cabs)                | Hansa-Leuchten (für Hell-Dunkel Taxis)              | 15 |
| Tweezers 105 mm                                   | Pinzetten 105 mm                                    | 20 |
| Counting chamber, double subnet                   | Zählkammer, doppeltes Teilnetz                      | 20 |
| counter   | Handzähler  | 73 |
| Horizontal shaker (GFL 3005)                      | Horizontalschüttler (GFL 3005)                      | 1  |
| Pipettes leak tester                              | Pipetten Dichtheitsprüfgerät (Brand, PLT -unit)     | 1  |
| Thermo shaker for 1.5 ml reaction tubes (Biozym)  | Thermoschüttler für 1,5 ml Reaktionsgefäße (Biozym) | 2  |
| fridge  | Kühlschrank   | 1  |
| Industrial pedal bin, red                         | Industrie-Treteimer, rot                            | 2  |

|  |  |    |
|--|--|----|
| Centrifuge Tubes + Lid, PC<br>26.3ml for Beckmann<br>Ultracentrifuge, Rotor Ti<br>50.2 | Centrifuge Tubes + Deckel, PC<br>26,3ml für Beckmann<br>Ultrazentrifuge, Rotor Ti 50,2 | 24 |
| Serva Blue Power 500x4   | Serva Blue Power 500x4   | 2  |
| Thermocycler (Eppendorf,<br>25 x 0.2 ml tubes)   | Thermocycler (Eppendorf, 25 x 0.2<br>ml Gefäße)  | 2  |
| small benchtop centrifuge<br>(EBA) 8 x 15 ml, 6000<br>rpm)                             | kleine Tischzentrifuge (EBA) 8 x 15<br>ml, 6000 Upm)                                   | 4  |
| Microcentrifuge, cooled<br>(Eppendorf 5414 R)  | Mikrozentrifuge, gekühlt (Eppendorf<br>5414 R)   | 2  |
| Rotating Evaporator  | Rotationsverdampfer  | 1  |
| Microcentrifuge<br>(Eppendorf 5424)  | Mikrozentrifuge (Eppendorf 5424)   | 1  |
| Libra S12 Spectral<br>Thermometer UV/VIS   | Libra S12 Spektralthermometer<br>UV/VIS  | 6  |
| Vacuum pump Laboport<br>N86 KN.18 (100mbar)  | Vakuumpumpe Laboport N86 KN.18<br>(100mbar)  | 4  |
| Suction erlenmeyer flask 1l  | Absaugerlenmeyerkolben 1l  | 4  |
| Tube material  | Schlauchmaterial   | 1  |
| Cooling centrifuge 5810<br>50/15 ml Greiner  | Kühlzentrifuge 5810 50/15 ml<br>Greiner  | 1  |
| Centrifuge (5804R),<br>cooled, 20000 x g, with<br>equipment                            | Zentrifuge (5804R), gekühlt, 20000<br>x g, mit Zubehör                                 | 1  |
| Bath tank (13l) for<br>immersion thermostat  | Badgefäß (13l) für<br>Einhängethermostat   | 10 |

|   |   |     |
|---|---|-----|
| pH meter with pH electrode                      | pH-Meter mit pH-Elektrode                     | 20  |
| Tektronix oscilloscopes TDS 1001B               | Tektronix Oszilloskope TDS 1001B              | 6   |
| Vertical electrophoresis (BIORAD)               | Vertikal-Elektrophorese (BIORAD)              | 3   |
| Thermoblock, small field for 24 Eppendorf tubes | Thermoblock, Kleinfeld für 24 Eppendorfgefäße | 1   |
| Zeiss - microscopes                             | Zeiss Mikroskope                              | 141 |
| Zeiss - Stereo microscopes                      | Zeiss Stereomikroskope                        | 164 |
| Zeiss - Microscopes with camera (camera tube)   | Zeiss Mikroskope mit Kamera (Kameratubus)     | 25  |

Table 28: Sample Equipment Pool – School students lab Biology - Osnabrück University

| Item (eng.)  | Item (german)                                      | Quantity |
|--|--|----------|
| Fridge with freezer compartment                      | Kühlschrank mit Gefrierfach                        | <b>1</b> |
| microwave  | Mikrowelle   | <b>1</b> |
| Small table autoclave                                | kleiner Tischaufoklav                              | <b>1</b> |
| pc   | PC   | <b>1</b> |
| keyboard   | Tastatur   | <b>1</b> |
| mouse  | Maus   | <b>1</b> |
| network access                                       | Netzwerkzugang                                     | <b>1</b> |
| monitor  | Monitor  | <b>2</b> |
| Fluorescence microscope with video ca                | Fluoreszenzmikroskop mit Videokamera               | <b>1</b> |
| UV table   | UV-Tisch   | <b>1</b> |
| UV Gel documentation imager                          | UV-Geldokumentationseinheit                        | <b>1</b> |
| Thermocycler Eppendorf                               | Thermocycler Eppendorf                             | <b>1</b> |
| Photometer with cuvettes, two of them with UV range  | Photometer mit Küvetten, zwei davon mit UV-Bereich | <b>5</b> |
| magnetic stirrer                                     | Magnetrührer                                       | <b>5</b> |
| Centrifuges for test tubes                           | Zentrifugen für Reagenzgläser                      | <b>2</b> |
| Microfuges for Eppendorf sample tubes                | Mikrofugen für Eppendorf-Probengefäße              | <b>2</b> |
| Electrophoresis chambers with combs for protein gels | Elektrophoresekammern mit Kämmen für Proteingele   | <b>4</b> |

|  |  |          |
|--|--|----------|
| Electrophoresis chamber with combs for agarose gels            | Elektrophoresekammer mit Kämmen für Agarosegele            | <b>1</b> |
| Voltage devices  | Spannungsgeräte  | <b>2</b> |
| Laboratory alarm clock/timer                                   | Laborwecker  | 10       |
| Test tube rack/stand   | Reagenzglasständer   | 40       |
| Water baths (small)  | Wasserbäder (klein)  | <b>5</b> |
| Vortex shaker  | Vortex-Schüttler   | <b>5</b> |
| Eppendorf sample rack  | Eppendorfprobenständer                                     | 20       |
| Safety goggles   | Schutzbrillen  | 20       |
| Steel cupboards, lockable                                      | Stahlschränke, abschließbar                                | <b>2</b> |
| Thermal units for Eppendorf sample vessels (up to 100 degrees) | Thermoeinheiten für Eppendorfprobengefäße (bis 100 Grad C) | <b>2</b> |
| Pipette tips   | Pipettenspitzen  | 60       |
| Solvent cupboard   | Lösungsmittelschrank                                       | <b>1</b> |
| Dishwasher   | Spülmaschine   | <b>1</b> |
| Table centrifuge with heating                                  | Tischzentrifuge mit Heizung                                | <b>1</b> |
| large autoclave  | großer Autoklav  | <b>1</b> |
| Heating cabinet  | Wärmeschrank   | <b>1</b> |
| incubator  | Inkubator  | <b>1</b> |
| Gilson pipette P20   | Gilson Pipette P20   | 10       |
| Gilson pipette P200  | Gilson Pipette P200  | 10       |
| Gilson pipette P1000   | Gilson Pipette P1000                                       | 10       |

