



DENTAL SCHOOL GRONINGEN

GENERAL INFORMATION

Hallmarks of the curriculum

The goal of the Dental School in Groningen is to deliver dentists who are well prepared to provide dental care according to professional standards. These dentists know how to work with other professionals, are accountable for their clinical actions, and keep up to date with scientific developments.

To achieve this, the curriculum of the Dental School is problem based, patient orientated and has a focus on inter-professional cooperation. Due to the problem based character of the curriculum, students learn to actively acquire both knowledge and skills in the clinical context. In the curriculum the student is encouraged to develop scientific skills, for example using a scientific approach to problem solving, logical reasoning and self-reflection. Scientific approach and clinical aspects are integrated in the curriculum. In the clinical training experts of different dental departments from the Academic Center of Oral Health work in teams to achieve the best dental care for the patient. These teams consist of dental and dental hygiene staff and students.

A six-year curriculum

The six-year curriculum of the Dental School in Groningen consists of a three-year **Bachelor** that covers 180 European Credits and a three-year **Master** of 180 European Credits.

Facilities

Psychomotor (manual) skills are trained in the skills lab. For the clinical training there three well equipped clinics available. There is also a separate clinic used by staff members used for intake of patients, emergency dentistry and parts of electives. Finally, one theater is available for treatments like dentoalveolar surgery, implantology and periodontology. Students use the electronic learning environment of "Nestor" (based on Blackboard). The students have good access to additional support and guidance from a team of study advisors.

Student intake

The annual student intake is 48 students. In recent years the majority (> 65%) of the students is female.

Language

Dutch is the common written and spoken language in the curriculum. Textbooks prescribed for the curriculum are in Dutch or English.

Regulations

Behavior, roles and responsibilities are defined in formal procedures, for example for (personal) hygiene. In the clinic patient treatment is performed according to protocols.

Structure of the curriculum

In 2001 in Groningen a new curriculum was introduced, the so-called curriculum T21 – referring to train the students to be a qualified dentist for the 21st century. In this curriculum seven different roles are distinguished, that are based on the qualified dentist's future practice:

1. **Dentist** who aligns all aspects of care and treatment to the individual patient's desired and feasible goals relating to dental health and is able to provide the appropriate care and treatment;
2. **Medical practitioner** who has sufficient knowledge and skills to place dental health within the context of the patient's general health and well being;
3. **Care provider** whose behavior and acquired communication skills enable him or her to provide optimal care to patients and cooperate with other professionals in health care;
4. **Manager** who organizes and manages his or her working environment in such a way that optimal care can be provided to individual patients as well as the community within the region

in which the practice is situated;

5. **Scholar** who is able to practice evidence-based dentistry based on well-founded scientific arguments and follows new developments and appraises these in a scientifically sound manner;

6. **Individual** who can make decisions based on individual interests and qualities and can specialize in one of the dental fields and is able to make his career planning.

7. **Professional** who is able to integrate the above six roles in professional practice and is accountable for his or her actions.

The seven roles are linked with [seven lines in the curriculum](#).¹ In each line the competencies, i.e. the appropriate knowledge, skills and behaviors, are trained (Fig. 1). The lines of the curriculum have different volumes. The line *Dental knowledge and skills* features prominently in both **Bachelor** and **Master**.

Role	Line
■ Dentist	■ Dental knowledge and skills
■ Medical practitioner	■ Medical knowledge and skills
■ Care provider	■ Behavioural sciences - thinking and acting
■ Manager	■ Organisation - oral health and practice
■ Scholar	■ Scientific thinking and acting
■ Individual	■ Personal profile
■ Professional	■ Professionalisation

Figure 1. The seven roles and lines of the curriculum.

OVERVIEW OF BACHELOR AND MASTER

Bachelor T21

In the **Bachelor** students learn a broad range of knowledge and skills relating to basic dental and medical concepts, scientific aspects, professionalism and psychomotor skills. The first year, the 'propaedeuse', offers a student orientation to the educational programme and the future profession. In the following years the basics learnt in year 1 will be deepened and extended.

The first semester in year 1 offers an introduction to the lines of T21, the patient and the professional field. Other subjects are the patient's course of life, including growth and development of the body, the head and neck region in particular as well as structure and function of the masticatory system. Subjects addressed are ageing, mutilated dentition and the edentate mouth. In the second semester the central theme is structure and function of the body and the mouth. The topics addressed are: etiology, diagnosis and prevention of dental problems like caries and periodontopathies.

The central themes of years 2 and 3 are identification, explanation and diagnosis of defects in oral health. The knowledge and skills related to subjects dealt with in year 1 are deepened and extended by adding knowledge about defects relating to growth and development of the head and neck region, preparations and restoring, odontogenic inflammations, full extraction and mucosal defects. Topics, such as behavior, communication and disease management are addressed in relation to the oral care subjects. Patients' general health is addressed as well as disorders and implications for the provision of (oral) care, effects and side effects of medications and medical emergencies.

Figure 2 shows a schematic overview of the **Bachelor**. Every year is divided into two semesters, each covers twenty-one weeks. Two theoretical units are offered per semester.

¹ This document has several internal links, marked in red letters. Clicking on them will take you to another section of the document. To return to your earlier position, click on the ← symbol.



These units are characterized by the 'ten day learning cycles' Tutor group (PBL) sessions are linked to these units. Each learning cycle covers a certain dental theme. For example: in the fourth unit of the first year ('Threat and protection'), the theme 'periodontal disease' is scheduled. Linked to this theme are related topics like 'non-specific defense mechanisms' and 'influencing patients' behavior'.

In each year there are three longitudinally units scheduled:

1. **Dental skills and skills-related knowledge** training in the skills lab and on the clinic. The introduction to the clinic is in the second year, whereas students start with patient care in the third year. In the clinic the students work in couples, one student as the operator and the other as the assistant.
2. **Academic training** students learn how to apply scientific concepts and principles to solve specific problems.
3. **Professionalisation** students learn to develop their professional skills for instance by practicing self-reflection.

Electives (*Personal profile*) start in the second year. The elective program provides a wide range of dental (like oral surgery) and non-dental (like language skills) objects. Students interested in a scientific career can participate in the Junior Scientific Master.

SEMESTER 1		SEMESTER 2	
Insight into the dental profession	The human lifecycle	The oral environment	Threats and protection
Academic training 1		Academic training 1	
Professionalization 1		Professionalization 1	
Dental skills - skills related knowledge 1		Dental skills - skills related knowledge 1	
Tissue loss	Oral medicine	Infections of dental origin and acute pain	Defects in growth and development
Academic training 2		Academic training 2	
Professionalization 2		Professionalization 2	
Dental skills - skills related knowledge 2		Dental skills - skills related knowledge 2	
Personal profile		Personal profile	
Restoration of occlusion	Complex diagnostics and treatment	Special oral health care (1)	Special oral health care (2)
Academic training 3		Academic training 3	
Professionalization 3		Professionalization 3	
Dental skills - skills related knowledge 3		Dental skills - skills related knowledge 3	
Personal profile		Personal profile	

Figure 2. Schematic overview of the **Bachelor T21**.

Assessment

In the **Bachelor**, students are assessed in different ways. Students manage their own portfolio for *Professionalisation* and clinical training programme.

Master T21*

The theoretical units cover topics like complex dental care and treatment of children, groups with special care needs and elderly patients. Other topics are: treatment of mutilated dentition and surgical treatment options, periodontal regeneration therapy, implantology, endodontic repeat treatment and oral health care in nursing homes.

The majority of the **Master** consists of patient care. This part of the program contains several units, such as treatment of patients in teams, treatment of children, and internships like 'Oral Surgery' and 'Orthodontics'.

In the **Master** the student can take electives from a variety of clinical topics, such as periodontology, endodontology, treatment of mutilated dentition, dental care for special groups. The core theme of the **Master** is the integration of clinical scientific reasoning and patient care. Students participate in research programs: they perform the different phases of a research project in a scientific traineeship, which results in a graduation project (thesis).

**In 2007 the Dutch government decided to change the two-year Master into a three-year Master. The new Master programme will start in 2010. At this moment the Master is under construction. The above description gives a rough outline of the programme.*



Box 1-Seven lines of the curriculum ←

1. In the line *Dental knowledge and skills* the focus is on knowledge and skills to maintain oral health: topics are etiology, diagnosis, prevention and treatment of oral problems, like diseases, disturbances in growth and development, and functioning of the dentition. A major part consists of *Dental skills and skills-related knowledge* : training in the skills lab and patient care.
2. In the line *Medical knowledge and skills* the focus is on the general health of the patient, the interactions with the oral health and dental care.
3. In the line *Behavioral sciences - thinking and acting* the student acquires the knowledge and skills required to provide good oral health care.
4. In the line *Organization - oral health and practice* the student acquires the knowledge and skills required to organize and manage oral health care at both practice and community levels.
5. The basis for the academic nature of the programme occurs within the line *scientific thinking and acting* which provides an integrated critical, scientific approach to theory and practice.
6. In the line *Personal development* the student can select from a range of elective studies supporting various aspects of the profession.
7. In the line *Professionalisation* the students learn to integrate the different roles, and to develop their ability to make responsible, reasonable and transparent decisions on their patient care.

Box 2 - Ten day learning cycle. ←

WEEK 1	Day 1	Day 2	Day 3	Day 4	Day 5
AM	Patient lecture Introduction lecture		Clinic		Skillslab
PM	Tutor group	Clinic	Skillslab		Coach group
WEEK 2	Day 6	Day 7	Day 8	Day 9	Day 10
AM	Mentor group		Clinic		Skillslab
PM	Tutor group	Clinic	Skillslab		Response lecture Magisterial lecture

The ten day learning consists of different items. The cycle begins with a 'patient lecture' in which a patient with a specific complaint or problem is presented and interviewed. The *introduction lecture* provides an overview of the cycle. In each cycle students meet twice in *tutor (PBL) groups*, facilitated by a tutor (a member of the faculty). In the first meeting, the student define the base line and a gap analysis on to be acquired knowledge. In this way the students learn to assess the quality of knowledge resources, use knowledge in a new context, cooperate and give oral and written presentations of their findings.

The first session of the tutor group focuses on the patient lecture and the cases relating to the theme of the learning cycle. In the second meeting the students discuss how they have tackled the assignments. The learning cycle ends with a *response lecture* and a '*magisterial*' lecture. In the response lecture questions from the discussions in the tutor group will be discussed. In the magisterial lecture the teacher presents a broad retrospect on the topic of the cycle. Besides the tutor group, there are *lectures, practical exercises* (skill slab, clinical training) and mentor group and/or coach group meetings scheduled. The rest of the time is allocated for working on the assignments, preparing for (pre)clinical practices and self-study.

Box 3 – Dental skills and skills-related knowledge ←

Skills lab

The skills lab program consists of several modules, for example the module 'composite preparations and restorations'. In the module theory is linked to skills lab topics, such as ergonomics, sterility and hygiene, preparations and restorations using plastic restoration materials, root canal procedures, full prosthesis and crowns.



Clinical training

In the second year an introduction program is scheduled, and in the third patient care is started. In the Master, the student is introduced into the Groningen team concept, where, dental and dental hygiene students work in teams. Linked to patient care these teams discuss topics like 'clinical-scientific-ethical reasoning' and treatment plans. In these meetings also self-reflection on clinical activities are shared.

Box 4 - Line *Scientific thinking and acting* ←

In the Dental School the academic training is an important feature. In the line *Scientific thinking and acting* three components can be distinguished:

- Firstly, the students are introduced to the basics of scientific thinking and acting and learn skills, such as problem solving, analyzing and critical reasoning.
- Secondly, there is a longitudinal component, with integration of scientific thinking and acting with the theoretical and practical courses from the other lines. During the clinical phase, scientific thinking is incorporated in clinical decision making (Evidence based dentistry).
- Thirdly, students participate in scientific research. In mentor groups, students learn how to apply scientific concepts and principles by resolving specific problems and performing specific assignments related to dental research. The students also learn how to present data and findings (oral/written) and how to critically appraise scientific research data. The students brainstorm about research questions, present and discuss scientific articles and books and discuss review applied methods and data interpretations.

In year 1 students learn how to tackle problems in a systematic manner and use methods of statistical data analysis. They also learn how to find, use and appraise data sources.

In year 2 and 3 the focus is on aetiopathogenesis, risk, diagnosis, therapy and prognosis of dental / medical problems. In this way clinical and scientific reasoning go hand in hand, which builds a foundation for well-considered evidence based decision making. Methods of scientific research (including design, performance and reporting) are applied by the students both in the Bachelor and Master. In the Master, the academic training is completed with a graduation project.

Box 5- Line *Professionalisation* ←

The program of the Dental School is characterized by seven lines in the curriculum. In six lines a broad range of theoretical and technical skills is offered. In the line Professionalisation the emphasis is on professional training. This can be explained as follows: A professional is able to treat problems in dental health care *and* recognizes his accountability for decisions and actions. In other words a professional is able 'to do things right' *and* is able 'to do the right things'. In the line Professionalisation students learn how the use knowledge and skills appropriately and to account for their actions ('do the right things'). This line is intertwined with patient care and treatment. Appraisal of students' functioning, including professional behavior builds the foundation for accountability. Key criteria for this appraisal are integration of the different roles of the dentist and accounting for decisions and actions to oneself, the patients, the profession and the community in a comprehensible, transparent and well considered manner. In order to achieve these competencies the students learn skills like (self) reflection and peer evaluation.

Courses on reflection and peer evaluation are scheduled in year 1. Accountability is learnt when students produce (reflection) reports based on appraisal of behaviors, clinical internships and the traineeships in dental practice. The reports and assignments related to Professionalisation are collected in a portfolio.

The training in professionalism is the **coach groups**. Dentists-general practitioners coach the students in the processes of developing their professionalism. Related to the line Professionalisation there is a **dental outreach program** in which students are 'adopted' by dentist-general practitioners to gain clinical experience in different dental settings. The students' experiences within these adoption-practices are also discussed in the coach groups.



Box 6 – Assessment Bachelor and Master ←

In the Dental School, the examination program is based on the principle of frequent *formative* assessments and a few *summative* (pass-fail) examinations with limited opportunities to resit. Formative assessment is used to give the student feedback, to prepare for the summative assessment.

Bachelor

Propedeuse. The first year (propedeuse) is designed to give the student a good insight in the study and the dental profession. The propedeuse fulfils a selective purpose for the Dental School: once the student has finished the propedeuse, he should be able to follow the rest of the **Bachelor** programme.

Theoretical program. The theory is assessed using written examinations every four or five weeks. The examinations consist both of practical based and knowledge-based assessments.

Skills lab

A practice-based or objective structured examination is administered at the end of each module. Students are allowed to use skills in patient care so far as these skills received satisfactory ratings in the skills lab

Clinical training. Within the clinical programme a portfolio is used. Students progression in clinical skills and patient care is assessed three times formative and at the end of the year summative. After each assessment, students have to draft an improvement plan based on the feedback by their faculty.

Professionalisation. In the line Professionalisation there is an annual formative assessment wherein the student, using his portfolio, demonstrates and explains his growth and professional development.

Master

Examination in the Master follows the same approach as used in the **Bachelor**, with an increasing focus on patient care. This takes place in conjunction with a number of individual projects, for example the elective studies and the clinical internship. The academic training is completed with a graduation project.

Box 7 – Clinical training in teams ←

In the Netherlands, the Dental School in Groningen has the longest history of interprofessional cooperation between dentists and dental hygienists. In the clinical training program of the Master, dental students work in teams in which dental hygienist students participate. In the teams the students are trained in *inter*professional cooperation (among dental and dental hygiene students) and also in *intra*professional cooperation (among dental students). An example of intraprofessional cooperation is 'horizontal' referral of patients to clinical elective programs (VIDEO TEAM WORK). In combination with the patient treatment, weekly team meetings are scheduled in which students are trained in making treatment plans, managing the day-to-day clinical business. In this meetings students are trained in the integration of dental, medical, ethical and scientific aspects of patient care (Clinical reasoning).

In the clinical training, the different departments of the Dental School are involved to achieve the concept of 'integral' patient care. For example, in the Bachelor, students make 'integral' treatment plans for patients that might have problems of caries, periodontal diseases and/or endodontic problems. In the Master 'integrated' treatment plans are made for patients with more complex dental and/or medical problems. Beside the integral program, clinical training is also offered for special group of patients, for example children).