BioSB Research School

International Review committee

Documents

3 April 2017

Congrescentrum De Werelt, Lunteren, the Netherlands

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Pre-amble

An introductory word from the BioSB board

We would hereby like to thank you for your willingness to act as a member of the Review Committee of the Netherlands Bioinformatics and Systems Biology Research School (BioSB).

Allow us to briefly introduce the BioSB research school. The BioSB research school started its activities in 2014 and was officially launched in 2015. It brings together bioinformatics and systems biology communities in the Netherlands. The aim of the school is to offer PhD students and postdocs a vibrant environment for their scientific development as well as education in integrative bioinformatics and systems biology. In addition, BioSB is the national platform in which the Dutch community of researchers in bioinformatics and systems biology is organized. To meet its goals BioSB organizes basic and advanced courses, hot topics meetings, the yearly BioSB conference (to be held on 4 and 5 April, following the site visit) and a yearly assembly of its members. BioSB furthermore acts as parent organization for YoungCB, the official Regional Student Group (RSG) Netherlands of the International Society of Computational Biology (ISCB).

Although we have compiled a document, contained in the set of accompanying documents, with more detailed questions to the Review Committee, we would like to give you a brief heads-up. We would like the Review Committee to evaluate the BioSB research school from an international perspective. Specifically, we would appreciate advice and guidance regarding its education programme, viability, vitality, and general organization. We launched the school two years ago as a follow-up of funded national initiatives in bioinformatics (The Netherlands Bioinformatics Centre (NBIC)) and systems biology (The Netherlands Consortium for Systems Biology (NCSB)). After the funding of these programmes was terminated, we decided to integrate the bioinformatics and systems biology communities at the national level. The education portfolio is tailored to these two disciplines, and the yearly conference caters for both communities. We would like to emphasize that BioSB is a very young organization encountering the usual startup-problems. We would specifically appreciate advice regarding strategic choices we will need to make in the near future. The school is organized entirely bottom-up by dedicated PIs and funded by member and course/conference fees. We would like the Review Committee to report their findings and advise the BioSB board on the matters outlined in the accompanying document (but certainly not only limited to these).

The accompanying set of documents have been assembled to outline our specific questions to you, but more importantly, to provide you with an overview of the activities of BioSB. If you need additional information, please do not hesitate to get in touch.

The board of BioSB: Jaap Heringa (chair), Lodewyk Wessels, and Barbara Bakker

March 2017

Programme BioSB Review Meeting

Monday April 3, 2017

Participants

BioSB:

- Board: Jaap Heringa, Barbara Bakker, Lodewyk Wessels
- BioSB office: Celia van Gelder, Femke Francissen
- Representative from the Scientific, Education and PhD committees

BioSB Review Committe members:

- Teresa Attwood
- Boris Kholodenko
- Emmanuel Barillot

Programme

12:00 - 13:00	Lunch
13:00 - 13:10	Welcome and introduction of participants (Jaap Heringa)
13:10 - 13:30	Introducing BioSB (Jaap Heringa)
13:30 - 13:45	BioSB Governance (Barbara Bakker)
13:45 - 14:15	Conference & Community • Overview of activities (Lodewyk Wessels) • Scientific committee (Bas Teusink) • YoungCB (Joske Ubels)
14:15 - 14:35	Coffee break
14:35 - 15:05	Education programme (Celia van Gelder, Jaap Molenaar)
15:05 - 15:35	Finances and sustainability (Celia van Gelder, Jaap Heringa, Barbara Bakker, Lodewyk Wessels)
15:35 - 16:00	Discussion
16:00 - 17:00	Discussion time for Review committee
17:00 - 17:30	Preliminary feedback from the review committee.
18:00/18.30	Drinks and dinner

Wednesday April 5, 2017

13:15 - 14:30 BioSB members meeting
Presentation results Review by Review committee members

Questions for the Review Committee

The BioSB research school is in operational existence for two years. Following a request by the members, an international review of the BioSB activities portfolio has been scheduled.

The goal of this review meeting is to evaluate the BioSB efforts to set up a sustainable, high quality research school serving two research communities: Bioinformatics and Systems Biology and to advise the BioSB board regarding future directions.

Below we list a number of specific topics the Review Committee may take into account in their review; not all questions need to be addressed, but provide guidelines. Other topics may be brought in.

Content and quality of BioSB programme

- Courses
    - All bioinformatics and systems biology topics covered?
        - Courses to be discontinued?
        - Build in data science orientated courses?
        - Devote more attention to big data?
    - Types of courses sufficient (core/intro..)
    - Level appropriate?
    - Does the committee deem attendance of courses appropriate?

- Meetings
    - Hot topics
        - Format effective?
        - Important topics not covered?
        - Any other urgent topics?
    - BioSB Conference (evaluate conference on 4-5 April)
        - Format and types of sessions effective?
        - Scope
        - Composition of delegates

Vitality

Do we offer a sufficiently vibrant environment for our members?

- Do the various committees cover the required topics?
- Do BioSB members perceive that we are adequately and sufficiently active (may be determined during the conference)?
- Any advice on national and international collaboration/ partnerships?

Viability

- Does the current financial model lead to sustainability?
    - Any advise on membership and course fees
    - Any advice on the model itself?
- Is the current target community of bioinformaticians and systems biologists appropriate?
    - Should we become more inclusive towards a broader life science focus (e.g. including experimental work) or should we become more strictly computational?
- More involvement of the industrial partners?
    - Do we need a separate industrial platform?
- Is the organisational structure appropriate?

Metrics for success

- Do we evaluate our activities appropriately?
    - Quality of student questionnaires
- How often and in what format should BioSB be reviewed?
- Are their any other metrics that the committee would advise?

Mission

BioSB Mission statement 2014

Netherlands Bioinformatics and Systems Biology Research School (BioSB)

October 2014

Mission
BioSB aims to offer a vibrant environment for the scientific development of and the education in integrative bioinformatics and systems biology. The research school will foster building and maintaining a close research community where trust, loyalty, and mutual respect are key aspects driving research and education. The research school aims to generate high-quality human capital that is ready to unravel the complex biological systems that are key to health, biotechnology, sustainability and bio-economy by using computational approaches. It includes both experimental life scientists that use mathematical modelling or computational analysis in their research strategy and theoreticians that develop modelling and computational approaches to address real-world life science problems. BioSB will closely liaise with the cross-disciplinary, integrative and data stewardship activities and education programme of the Dutch Techcentre for Life Sciences (DTL), and will offer anchor points for the European infrastructures in bioinformatics (ELIXIR) and systems biology (ISBE).

Motivation
Bioinformatics and systems biology are interlinked and highly interdisciplinary fields that have become indispensable for knowledge generation and integration in biomedical and life sciences. This is mainly based upon the breath-taking developments in data generation technologies and computational infrastructure, which are leading to truly massive data sets. Together, these big data hold immense promise for medicine, biotechnology and ecology, but technologies need to be developed to generate biological understanding from these data streams. Here, bringing together and integrating very different kinds of data is a crucial component that is key to elevating the power of subsequent data analysis modes. In addition to data-driven analysis, a powerful way to gain understanding of biological systems and provide guidance for efficient experimental approaches is modelling and model-based simulation. Developing new modelling approaches, for example multi-scale approaches to tackle biological complexity, and standards for model integration is urgently needed for scaling up from the molecular to the organismal level. Together, these developments will enable addressing major biological and biomedical challenges that will benefit mankind.

Given the inherent degree of interdisciplinarity of the field, bringing together mathematics, computer science, chemistry, physics, engineering, biology and medicine, a new type of researcher needs to be trained that is equally at home in biological and in computational issues to address the scientific issues at stake. Bioinformaticians and systems biologists must be able to converse fluently with this variety of disciplines, whilst remaining profound in their own specialty. Hence a new type of 'transdisciplinary' training is urgently needed in order to deliver the bioinformaticians and systems biologists needed in industry and academia. They will be integrators and knowledge generators in the data-intensive sciences that open the road towards precision medicine and precision biotechnology in the near future.

Scientific focus
All computation-requiring aspects of molecular health and life sciences geared at addressing urgent biomedical, biotechnological, bio-economical and sustainability challenges in modern society. These include algorithmics, big data issues, network and combinatorial problems, control and regulation, standardisation, intra- and intercellular modelling, model-driven experimental design, data analysis and information retrieval.

Education
Given the wide application area of bioinformatics and systems biology, a well-structured and versatile training programme is being developed. It will consist of (i) annual five-day introductory courses, (ii) advanced courses, and (iii) specialised courses. The programme builds on the successful training programmes developed by the recently finished NGI programmes Netherlands Consortium for Systems Biology (NCSB) and Netherlands Bioinformatics Centre (NBIC). The best practices developed by these previous NGI centres over the past five-plus years and the large group of tutors and staff already involved, constitute a solid basis for the new research school. Various modes of learning, encompassing education (one to many); training (one to fewer); consultancy (one to one); and helpdesk (one to one) will be developed in liaison with the Dutch Techcentre for Life Sciences (DTL). An application for KNAW accreditation will be submitted. Collaborations/partnerships with existing research schools and graduate schools will be initiated or strengthened (e.g. ASCI, EPS, Molmed, MCISB) in order to foster the exchange of expertise and students.

Other activities
- Annual conferences: the annual bioinformatics and systems biology symposia will merge.
- Hot topic and other thematic meetings
- Participation in international summer and winter schools (Innsbruck, Como, alliance with SIB) and international Lorentz Center workshops
- Organisation and underpinning of national and international student networks.
- International improvement and standardisation of training in systems biology, systems medicine and bioinformatics
- Support for training in computational biology at multiple levels (primary schools, industry, government, etc.)
- Act as national training centres for the European ESFRI infrastructures ISBE and ELIXIR
- Community activities, such as jamborees or software carpentries

Partners
- Universities
- Research institutes
- Medical centres
- Industry
- Various scientific and teaching platforms
- Top-sectors
- Ministries

Liaisons

National:

- Research schools and graduate schools (ASCI, EPS, Molmed, etc.)
- Networks of young researchers in bioinformatics (ISCB-RSG-NL) and systems biology (YISB)
- MSc bioinformatics and/or systems biology programmes
- BSc bioinformatics programmes at HBOs (LOBIN)
- KNCV
- NWO, FOM, ZonMw, KNAW

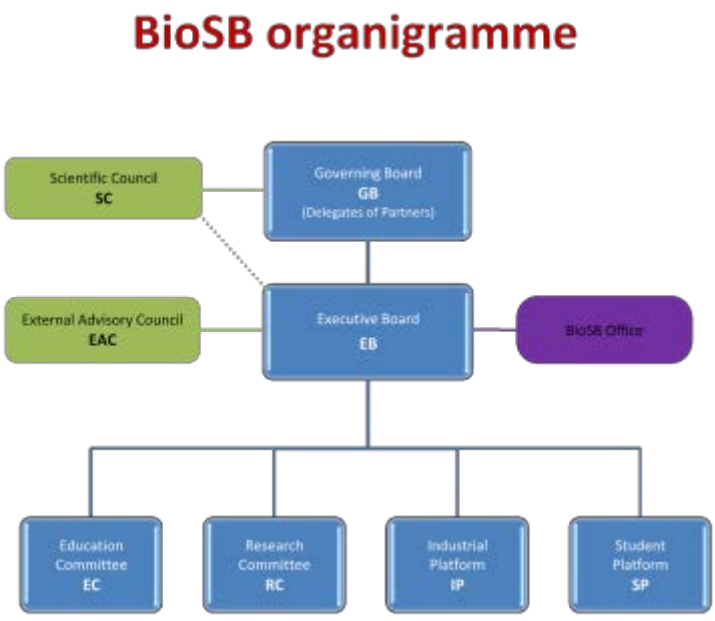
International:

BioSB welcomes collaboration with institutions in other countries. Liaisons already exist with:

- BE: Vlaams Instituut voor Biotechnology (VIB)
- CH: Swiss Institute of Bioinformatics (SIB)
- CH: Swiss Initiative in Systems Biology (SystemsX.ch)
- UK: Doctoral Training Centre of the Manchester Centre for Integrative Systems Biology (MCISB)
- UK: Oxford Centre for Integrative Systems Biology (OCISB)
- EU: the ESFRIs ELIXIR and ISBE
- Global Organisation for Bioinformatics Learning, Education and Training (GOBLET)
- International Study Group for Systems Biology (ISGSB)

Governance

The governance structure is schematically presented in the following organigramme.



Executive Board (EB). Day-to-day management of BioSB is the responsibility of the EB thereby assisted by the BioSB Office. The EB chairperson acts as BioSB Director. The EB is accountable to the Governing Board (GB) and directs the four main BioSB bodies, i.e. the Education Committee (EC), Research Committee (RC), Industrial Platform (IP) and Student Platform (SP).

Governing Board (GB). The GB is the body with the highest authority. Its members are mandated representatives of the partner institutions. The corresponding partner ('penvoerder') provides the

GB chair. The GB appoints (and has the power to dismiss) the BioSB Director and other EB members. The GB appoints (and has the right to dismiss) the SC members, thereby considering advice of the EB.
Scientific Council (SC). The SC assists and provides (solicited and unsolicited) advice to the GB on scientific, educational and organisational matters and shares this advice with the EB. The EB may also directly request advice from the SC.
External Advisory Council (EAC). The EAC will independently assess the research school's performance and reports to the EB. The EB invites people (after consulting the GB/SC) to become EAC member.
Education Committee (EC). The EC advises and assists the EB for conceiving, preparing and running training courses and safeguards operational issues.
Research Committee (RC). The RC safeguards scientific operational issues and advises and assists the EB on scientific matters. This includes acting as steering committee for hot topics meetings and other thematic meetings.
Industrial Platform (IP). The Industrial Platform (IP) represents industry (e.g. BIUP) and advises the EB.
Student Platform (SP). The Student Platform (SP) represents students (including Postdocs, PhD students, MSc students, and BSc students) and advises the EB.

Businessplan

(Note for the BioSB Review Committee 2017: the documents below were part of the Mission statement 2014, but are not included in the current documentation.)

The BioSB businessplan provides further information on:

- The educational programme (file name *' BioSB_Education_Programme'*)
- The names of the members on the various boards, councils, committees and platforms are listed in a separate document (file name *'BioSB_Governance_People'*)
- The businessmodel and associated budget (file name *'BioSB_Finance_Budget'*)
- Action plan with time line.

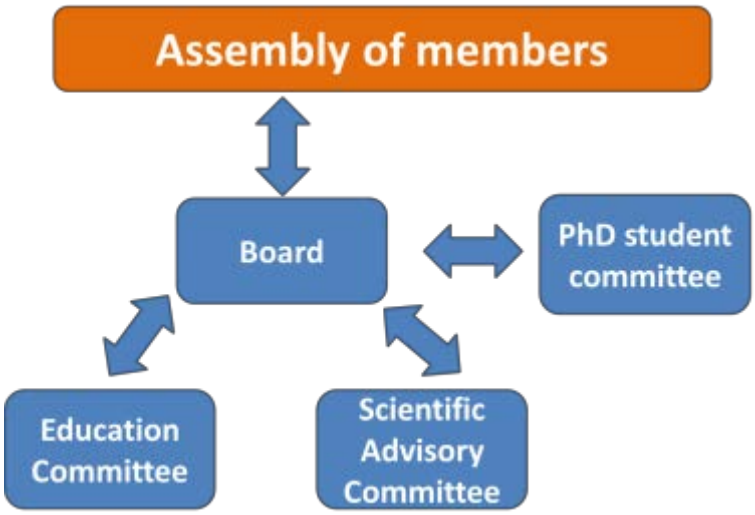
Website
www.biosb.nl

Implementation of Mission statement BioSB

March 2017

Major changes compared to original plan

1) The application for accreditation by the Royal Dutch Academy of Sciences (KNAW) was not submitted, because the scheme was discontinued.
2) The organizational structure was simplified in the following way:
   a) The Governing Board was abandoned, since partner institutions (universities) do not play the role that was originally foreseen. Instead, BioSB is an organization of members which together finance and organize the research school. The Assembly of Members, which meets every year at the BioSB conference, is therefore the authority that appoints members of the Executive Board and the various committees, and also has the right to dismiss them.
   b) The Scientific Council and the Research Committee were merged to avoid redundancy and make efficient use of the time of active members.
   c) A separate Industrial platform has not been implemented. Instead, members from Industry take part in the Education Committee and the Research Committee. It was judged that this ensures industrial involvement much better than a separate platform.
   d) The Executive Board and the Committees are elected by the Assembly of members according to regulations that have been written down in the Regulations of the school that have been approved by the Assembly of Members in 2016.
   e) The final organizational structure is shown below:



Finances

BioSB Financial Model

BioSB finances and sustainability

With the current absence of external funding, the BioSB budget is composed of the following elements:

- Income:
    - BioSB Course fees
    - BioSB Conference fees
    - BioSB memberships
- Costs:
    - BioSB Course costs
    - BioSB Conference costs
    - BioSB Office costs

It is evident that income related to courses and conferences are closely related to the income through BioSB memberships and the belonging membership benefits since we aim to make the course fees and conference fees as low as possible (or nil) for BioSB members.

Some important aspects of the budget:

- Financial support for part of the BioSB staff in 2014 and 2015 has been covered by CMBI (Centre for Molecular and Bioinformatics, Radboudumc Nijmegen).
- In 2015, an extra impulse was given to BioSB by both NBIC and SB@NL, who both donated 56.000 euro.
- There is currently no payment for researchers involved in course coordination and/or teaching. Members of the BioSB community all over the Netherlands commit time and expertise to take responsibility for part of the portfolio. This has been the case in the past and is also the proposed BioSB model. At this moment, the only compensation course coordinators get is one free seat to give away for their course to a selected participant.

The BioSB membership model

BioSB currently offers memberships to two categories of members:

- PhD students
- academic researchers at universities or non-profit research institutes

For each category, the list of benefits is described below.

Category	Annual fee	BioSB membership benefits
PhD student	500 euro	• Attend all BioSB courses from the Introductory and Core programme free of charge. • Reduced fee for attending the BioSB annual conference. • Attend several BioSB courses from the Specific Courses programme for a reduced course fee.
Academic researcher	300 euro	• Attend all BioSB courses from the Introductory and Core programme with a reduction of 50%. • Reduced fee for attending the BioSB annual conference. • Attend several BioSB courses from the Specific Courses programme for a reduced course fee. • Each researcher who acts as course coordinator for one of the BioSB courses, gets one free seat in the course.

Membership regulations

- The BioSB membership fee is inclusive of 21% VAT.
- The BioSB membership will be for the *duration of two years.*
- For new members, the BioSB membership will start with a period of two years. After this period of two years, the BioSB membership will be extended automatically each year, for the period of one year.
- BioSB memberships can be terminated by providing written notice (by email to education@biosb.nl) no later than one month before the end date of the membership.
- Individuals who have a short term contract can contact education@biosb.nl for more information about their BioSB membership possibilities.
- The starting date of the BioSB membership can be the first of each quarter (Jan 1, April 1, July 1, Oct 1).

Researchers can become a member by filling out the membership enrollment form at the BioSB website.

Currently (March 2017), BioSB has 36 PhD and 34 Academic researcher members

The BioSB course fee model

The table below shows the current BioSB fee model.

Category	BioSB membership	Course fee/course day (euro)	Remarks
PhD	YES	free	For BiosB introductory courses, e-courses, Core Courses
PhD	YES	reduction	For BioSB specific courses (amount may differ depending on the course)
PhD	NO	100	For BiosB introductory courses, e-courses, Core Courses
Academic researcher	YES	75	For BiosB introductory courses, e-courses, Core Courses
Academic researcher	YES	reduction	For BioSB specific courses (amount may differ depending on the course)
Academic researcher	NO	150	For BiosB introductory courses, e-courses, Core Courses
Industry	N/A	250	For BiosB introductory courses, e-courses, Core Courses

BioSB Staff

The current staff of BioSB exists of: Femke Francissen (0.4 fte), Celia van Gelder (0.2 fte). Financal matters are handled by Leonie Hek (MaxMo).

Note March 22, 2017: Further details about finances will be sent to the Committee later.

Ambition

The proposed combination model for course fees and memberships for BioSB is intended to enable the Dutch bioinformatics and systems biology community to establish a sustainable research school. And although a financial deficit is foreseen in the start period, this is covered by the initial injections by NBIC, CMBI and SB@NL. After implementation of this model in 2015, we will evaluate the results in 2017 and if needed refine and adjust this model.

Governance

Rules & regulations

Note: these regulations can also be found on the BioSB website.

Regulations of the Netherlands Bioinformatics and Systems Biology (BioSB) Research School

Article 1: The Postgraduate School, its bodies and officials
1.1 There is a postgraduate school, fully named Netherlands Bioinformatics and Systems Biology Research School and abbreviated BioSB, hereafter called the "School".
1.2 The School has two types of members: PhD students and academic staff from primarily, but not exclusively, Dutch universities and academic institutions. The academic staff members organise the School, according to the regulations formulated in this document.
1.3 The school is a subsidiary of DTL Data Projects (formerly known as NBIC), in the sense that all formal agreements, finance and financial accountability are executed within DTL Data Projects, which is managed by a Board of Directors. DTL Data Projects in turn is a subsidiary of DTL (Dutch Techcentre for Life Sciences). The formal relationship between DTL and the School plus the topics of intended collaboration are laid down in a Memorandum of Understanding.
1.4 The School has five official bodies: the Assembly of Members, the Board, the Education Committee, the Scientific Advisory Committee, and the PhD Committee.
1.5 The School has five officials: the Chair of the Board, the Managing Director, the Chair of the Education Committee, The Chair of the Scientific Advisory Committee, and the Chair of the PhD Committee.

Article 2: Mission of the School
2.1 The School aims to be the Dutch platform for research and doctoral training in bioinformatics and systems biology. The School is open to all scientists with an interest in bioinformatics and systems biology, including experimental life scientists that implement mathematical modelling in their research strategy as well as theoreticians that only use modelling and computation to address real-world life science problems.
2.2 The School recognises the need for high quality training and education of PhD students and Postdocs, using an interactive and multi-disciplinary approach, a continuing process of renewal in research and education, and encourages national and international collaboration. 2.3 The school also recognises the need of targeted national training at MSc and BSc level, and will contribute to this wherever relevant and executable.

Article3: Tasks of the School
3.1 The School organises and facilitates the training and education of PhD students, Postdocs, and occasionally other researchers.
3.2 The School creates an environment to foster the development of Bioinformatics and Systems Biology research in general, and especially amongst its members. Special emphasis is placed on creating opportunities for innovation, and promote co-operation between distinct fields of research within the School as well as to research infrastructure initiatives relevant to BioSB. To this end the School organises a yearly conference, the BioSB Conference, Hot Topics meetings, and when appropriate joint grant applications.
3.3 The School communicates and promotes externally the research of the members of the School, builds and maintains active networks with other national and international research groups and organisations, and explores everything that is useful for a better knowledge, understanding and positioning of what is done within the School.

Article 4: Assembly of Members
4.1 The Assembly of Members meets yearly, typically at the BioSB conference. At this meeting the members elect the other bodies; the other bodies report about their activities; the Board submits the budget for approval; and the policy of the School is discussed.

4.2. The meeting of the Assembly of Members is open to all persons active or interested in research training in Bioinformatics and/or Systems Biology, since BioSB aims to be an open community.
4.3. Only BioSB members have the right to elect officials and bodies of the School and approve the budget.
4.4 The benefits for BioSB members include activities of the School, such as reduced course fees and priority regarding admission to courses.

Article 5: Board
5.1 Only active Principle Investigators that are a member of BioSB can be a member of the board.
5.2 The BioSB members elect the Board members for 3 years. This appointment can be renewed once for the same period. A situation in which all Board members resign at the same moment will be avoided whenever possible.
5.3 The Board decides on all matters concerning the performance of the education and research programs of the School.
5.4 The Board decides on all matters concerning the internal quality management and the external quality reviews of the School.
5.5 The Board delegates the tasks amongst those appointed in the School.
5.6 The Board mandates tasks to the Chair of the Board and the Managing Director, a well as to the Scientific Advisory Committee, the Education Committee and the PhD Committee.
5.7 The Board is advised by the other bodies of the School and reports on its activities to the assembly of members at its yearly meeting.
5.8 The Board informs the BioSB members regularly about activities of the School.
5.9 The Board can propose further regulations within the School to its members.

Article 6: Education Committee
6.1 The Education Committee of the School is elected by the BioSB members and consists of Principal Investigators at Dutch universities or academic institutions, with a clear focus on Bioinformatics and/or Systems Biology. They are all BioSB members. One of the members of the Education Committee is a representative from industry. In addition, one of the members of the PhD Committee is also a member of the Education Committee.
6.2 The Education Committee advises the Board and the Managing Director on all questions regarding the education policy and tasks of the School.
6.3 The Education Committee is responsible for the development and supervision of the course programme of BioSB.

Article 7: Scientific Advisory Committee
7.1 The Scientific Advisory Committee of the School is elected by the BioSB members and consists of Principal Investigators at Dutch Universities or academic institutions, with a clear focus on Bioinformatics and/or Systems Biology. They are all BioSB members. At least one of the members of the Scientific Advisory Committee is a representative from industry.
7.2 The Scientific Advisory Committee advises the Board and the Managing Director on all questions regarding the scientific policy and tasks of the School.
7.3 The Scientific Advisory Committee is responsible for the organization of Hot Topics meetings and the yearly BioSB Conference. To this end the Scientific Advisory Committee delegates tasks to the local organizers who are supported by the BioSB office.

Article 8: PhD Committee
8.1 The PhD Committee is elected yearly by the PhD students who are members of BioSB as their representing body. Individual members can be re-elected twice.
8.2 Postdocs who are BioSB members can be advisory members of the PhD Committee.
8.3 The PhD Committee advises the Board, the Managing Director, and the Education Committee on all questions regarding the education policy and program of the School, and all other questions regarding the interests of the PhD students within the School.
8.4. The PhD Committee organizes a yearly PhD retreat, typically but not necessarily as a satellite meeting of the yearly BioSB Conference.

Article 9: Chair of the Board
9.1 The Chair of the Board is a professor with a clear focus on Bioinformatics and/or Systems Biology at a Dutch University, and is elected by BioSB members for a period of 3 years. The

appointment can be renewed once for the same period, and more than once only if no suitable alternative candidates are available for a next term.
9.2 The Chair of the Board chairs the Board and executes the mission and tasks of the School as decided by the Board.
9.3 The Chair of the Board is in charge of the management, including the financial management, of the School.
9.4 The Chair of the Board has the authority to delegate tasks within the School.

Article 10: Managing Director
10.1 The Managing Director of the School is appointed by the Board.
10.2 The Managing Director reports to the Board and supports them in all the tasks that they have to perform for the School.
10.3 The Managing Director supports all the other officials and bodies of the School. He/she provides solicited and unsolicited advice to the Board regarding the fulfilment of the mission and tasks of the School.
10.4 The Managing Director is responsible for all the executive tasks in the School.
10.5 The Managing Director heads the office of the School and delegates tasks to the people appointed in this office.
10.6 The Managing Director is the Secretary of all the bodies of the School.
10.7 If necessary, the tasks of the Managing Director can be adjusted depending on the financial situation of the School.

Article 11: Chair of the Education Committee
11.1 The Chair of the Education Committee is elected by the BioSB members for 3 years. This appointment can be renewed once for the same period. He/she is a professor with a clear focus on Bioinformatics and/or Systems Biology at a Dutch University.
11.2 The Chair of the Education Committee chairs the Education Committee
11.3 The Chair of the Education Committee communicates with the Board about the advise and activities of the Education Committee.

Article 12: Chair of the Scientific Advisory Committee
12.1 The Chair of the Scientific Advisory Committee is elected by the BioSB members for 3 years. This appointment can be renewed once for the same period. He/she is a professor with a clear focus on Bioinformatics and/or Systems Biology at a Dutch University.
12.2 The Chair of the Scientific Advisory Committee chairs the Scientific Advisory Committee.
12.3 The Chair of the Scientific Advisory Committee communicates with the Board about the advice and activities of the Scientific Advisory Committee.

Article 13: Chair of the PhD Committee.
13.1 The Chair of the PhD Committee is elected for 1 year by the PhD students who are a member of BioSB. He/she can be re-elected twice.
13.2 The Chair of the PhD Committee chairs the PhD Committee and communicates with the Managing Director and the Board. This communication serves to inform the Board regarding the activities of the PhD Committee and to advise the Board regarding the needs of the PhD student community.

Article 14: PhD Course Portfolio
14.1 The School offers a Course Portfolio to the PhD students and Postdocs of the School. All education activities are also accessible for other researchers within and outside the School, typically with an upper limit on the number of attendees per course.
14.2 The Course Portfolio of the School is limited to Bioinformatics and Systems Biology training, taking into account that the PhD students of the School are usually also embedded in a local graduate school that takes responsibility for training in soft skills, career development, and training in specialised aspects of biology.
14.3 The Education Committee implements and supervises the education program.

Article 15: Finance
15.1 The budget of the School consists of the budget for the salaries of the Managing Director and his/her assistants, and budget for courses and conferences and other activities of the school, paid from (1) membership fees; (2) course fees; (3) the financial budgets made available by DTL Data Projects; and (4) sponsoring budgets meant for activities of the School.

15.2 Every year the BioSB Board determines the budget of the School, as proposed by the Chair of the Board and the Managing Director, having heard the Education Committee, the Scientific Advisory Committee, and the PhD Committee. The annual budget gives a complete picture of the expected revenues and expenses that for salaries, training program, symposia, and all other activities of the School.
15.2 Every year the Managing Director drafts a complete financial overview of realized revenues and expenses of the previous year, which is evaluated by the Board.
15.3 Every year the Board requests consent for the budget to the Assembly of Members at their yearly meeting, and carries it out accordingly.
15.4 Every year the Board presents the financial overview of the previous year to the Assembly of Members.

Article 16: Annual Report
16.1 The Chair of the Board and the Managing Director draft an Annual Report of the activities of the School, based on input of the Education Committee, the Scientific Advisory Committee, and the PhD Committee.
16.2 The Board finalizes the Annual Report.
16.3 The Annual Report is presented to the Assembly of Members at their yearly meeting.

Article 17: International advise and evaluation
17.1 At least every 5 years the Board, in collaboration with the Education Committee and the Scientific Advisory Committee, organizes a site visit by a panel of internationally leading experts in the fields of Bioinformatics and Systems Biology. Typically, this will be a satellite meeting to the BioSB Conference.
17.2 Prior to the site visit, the Board in consultation with the other bodies, will prepare a concise report of the activities and achievements of the past 5 years and a plan for the coming 5 years.
17.3 At the site visit the panel will speak to all officials and bodies and meet other BioSB members.
17.2 The panel of international experts is asked to evaluate the PhD programme, the scientific activities, and the organization of the School, and to advise on its future strategy.

Article 18: Closing issues
18.1 All issues that are not covered by the regulations as outlined above will be dealt with by the Board of BioSB or the Board of Directors of DTL Data Projects, and/or put forward to the BioSB members, as seems most appropriate.
18.2 This regulation, or a change in this regulation, is operational after approval by the Assembly of Members.

These regulations were drafted by the BioSB board (Barbara Bakker, Lodewyk Wessels and Jaap Heringa) and approved by the BioSB Assembly of Members on April 19, 2016

BioSB Team & Committees

BioSB Board

Prof. dr. Jaap Heringa (Chair)
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Group leader Computational Biology, Netherlands Cancer Institute
Deputy director research, The Netherlands Cancer Institute
Chair, Computational Cancer Biology, Delft University of Technology
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University Medical Centre Groningen, University of Groningen
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BioSB Committees

Education committee

Prof. dr. Jaap Molenaar
Chair Mathematical and Statistical Methods, Wageningen UR
Chair Education committee BioSB
Members of the Education committee

Scientific committee

Prof. dr. Bas Teusink
Systems Bioinformatics, IBIVU, VU University
Chair Research committee BioSB
Members of the Scientific committee

PhD Committee (YoungCB)

Joske Ubels
UMC Utrecht / SkylineDX
President of the YoungCB / RSG Netherlands
YoungCB Board members

BioSB Office team

Dr. Celia van Gelder
Education manager BioSB
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Femke Francissen
Community & communications officer
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Conferences & community

BioSB conferences

Since the start of the research school BioSB organised three conferences:

- The BioSB 2017 conference, April 4-5, 2017 in congrescentrum De Werelt, Lunteren
- The BioSB 2016 conference, April 19-20, 2016 in congrescentrum De Werelt, Lunteren
- The BioSB 2015 conference, May 20-21, 2015 in congrescentrum De Werelt, Lunteren

The conference generally attracts around 300-350 researchers, students from mainly Dutch universities, university medical centers and institutes as well as from industry.

The BioSB Conferences follow the proven/successful format of the former NBIC conferences: a 2-day scientific conference, with 3-4 keynote speakers, several topical sessions and a social programme in the evening, in the congrescentrum De Werelt in Lunteren.

ECCB 2016

From 3-7 September 2016 BioSB co-organised the 15th European Conference on Computational Biology (ECCB 2016), together with the Dutch Techcentre for Life Sciences (DTL), Vrije Universiteit Amsterdam and the Delft University of Technology. The conference was held in The Hague and attracted more than 1100 researchers from all over the world.

NBIC Conferences & Systems Biology symposia, before 2015

Before BioSB, the Netherlands Bioinformatics Centre (NBIC) as well as the Netherlands Consortium for Systems Biology (NCSB) organised their own annual conferences.

NBIC organised 9 NBIC conferences from 2006 until 2014. NCSBorganised 6 SB@NL symposia from 2009 until 2014.

An overview can be found here

BioSB Scientific Committee

Members of the BioSB Scientific Committee (BSC) are:

- Bas Teusink, Vrije Universiteit Amsterdam (Chair)
- Marcel Reinders, TU Delft (vice-Chair)
- Berend Snel, Utrecht University
- Lude Franke, UMC Groningen
- Sacha van Hijum, Radboudumc, Nijmegen
- Jildau Bouwman, TNO
- Katy Wolstencroft, Leiden University
- Roeland Merks, CWI
- Jan-Peter Nap, Wageningen UR
- Joep Schmitz, DSM

This committee was selected in discussions between the Board and Teusink/Reinders to represent the BioSB community with respect to level of expertise, application areas and knowledge institutes.

The mission of the Scientific committee is to instigate scientific activities within the BioSB community, and to provide advice on scientific matters to the BioSB Board. We also see it as our task to identify scientific developments that should be discussed within our community, either through hot topics meetings or more strategic meetings. This mission is based on discussions at an interactive session organised at the BioSB meeting in 2016, where we asked the members for their expectations of the committee.

Meetings/mode of operation:
The committee has had meetings every three months via Skype (Sept, Dec, March, June). The agenda is prepared by Teusink, in consultation with Reinders and the secretary, Femke Francissen, who also makes minutes. Skype meetings work well and are efficient.

Activities:
BioSB Symposium: the BioSB main scientific activity is the yearly BioSB symposium. This symposium is each year organised by a knowledge institute in collaboration with the BioSB office, Board and the BSC. In 2017, the RUG is the organiser, with Franke as chair and Teusink and Reinders as co-organisers from the BSC.

Scientific meetings: BioSB instigates and facilitates the announcement and organisation of scientific meetings, either in specific hot topic format (see below), or other initiatives. Activities that have been initiated or facilitated specifically through involvement of the BSC are:

- Workshop BioBanking at the ECCB 2016 – Franke, Swertz
- Life Sciences meets Industry (1 week Lorentz workshop) April 2017 – Teusink is involved
- Systems Biology of metabolic regulation (March 2017) - Bruggeman

Hot topic meetings: we have identified, and found organisers for, 5 hot topic meetings for the coming period. Dates are expected soon:

- Nanosequencing (april 2017) - Thomas Abeel
- Single cell sequencing (tbd) - Ahmed Mafouz
- Single cell physiology, growth/metabolism systems biology (tbd) - Frank Bruggeman
- How to bring FAIRdom into the lab (tbd) – Douwe Molenaar
- Haplotyping (tbd) - Jan-Peter Nap

Strategic meetings: we identified Big Data and the role of Computer Science versus Bioinformatics/Systems Biology as a topic that should be discussed at a strategic level. We will initiate such a discussion at the BioSB Symposium 2017 and decide then on further actions.

Conclusions/discussion points:
The committee has good discussions and starts to get activities organised. We struggle a little bit with our role to represent the BioSB scientific community when more strategic opportunities arise, such as roadmaps for the Dutch Research Agenda, or the interaction with DTL. We feel we could do more, and that we could have better communication with the Board. We need to discuss with the Board how to organise and mobilise the community to get a strong and uniform voice.

RSG Netherlands/YoungCB

The Regional Student Group (RSG) Netherlands or Young Computational Biologists (YoungCB) provides a scientific and social network for young researchers and professionals in bioinformatics, computational biology and systems biology in the Netherlands. This is amongst other done through company visits, informal lectures by scientists, workshops and various social events, which stimulate scientific discussion and collaboration between PhD students and scientists. We are the official ISCB RSG for the Netherlands. In 2015 we also adopted the YoungCB name, which we believe to more descriptive than RSG, to gain more recognition in the Netherlands. We collaborate with RSGs from other countries, for example on the RSG BeNeLuxFra symposium coming up in July, which we organize together with Belgium, Luxembourg and France. With these type of activities we hope to provide an international platform for PhD students in the Netherlands.

We also organize an annual PhD retreat, preceding the BioSB conference. Here PhD students can present their own work, as well as take part in workshops and enjoy lectures by keynote speakers. The retreat also includes a social event, where PhD students from across the country can get to know each other and form the basis for future collaborations.

In addition, we act as the PhD committee for the BioSB. This mean we can provide input about the needs and wishes of PhD students in The Netherlands and collaborate on initiatives. To this end we also have a student representative in their Education Committee and will add a student representative to the Scientific Committee.

Board and faculty advisors

The current board started in September 2016 and consists of the following members:

Role	Name	Affiliation
President	Joske Ubels	Center for Molecular Medicine at the UMC Utrecht, Erasmus MC Cancer Institute & SkylineDx
Secretary	Mirella Kalafati	Bioinformatics – BiGCaT, Maastricht University
Treasurer	Elisa Cirillo	Bioinformatics – BiGCaT, Maastricht University
Acquisition	Gosia Komor	Division of Diagnostic Oncology, The Netherlands Cancer Institute
PR	Kyoko Watanabe	Centre for Neurogenomics and Cognitive Research at Vrije Universiteit Amsterdam

We also have three faculty advisors:

1. Prof. Dr. Jaap Heringa - Centre for Integrative Bioinformatics, VU University Amsterdam
2. Dr. Jeroen de Ridder - Center for Molecular Medicine, UMC Utrecht
3. Prof. Dr. Barbara Bakker - Faculty of Medicine, UMC Groningen

Events

Since the current board took over we have organized an activity every two months and aim to increase this to an activity every month. In 2017 we have already organized an activity in February and have events planned for March, April and May. The number of participants had varied over the years and between activities. There have been a bit fewer participants in the last couple events, which may be due to the fact that there were not many activities organized in 2016 and we need to start up again. We are focusing now on building a better mailing list which can be used to advertise events and getting a core group of participants involved. In the table below we give an overview of the activities organized by RSG Netherlands since 2014.

2014			
7 April	RSG retreat	22	The RSG retreat 2014 was held in Lunteren, preceding the BioSB conference. Lectures were held by Gert Vriend and Jeroen de Ridder.
30 June	BioCafe Delft	15	A BioCafe was organized in Delft, in collaboration with the BioSB research school course “Algorithm for Biological Networks”
2015			
19 March	BioCafe Amsterdam	15	BioCafe in Amsterdam organised in collaboration with the BioSB research school course “Pattern Recognition”. The program included a Bio-pantomime and networking.
21 April	NKI company visit	23	Company visit at the Netherlands Cancer Institute in Amsterdam. Program included lectures from group leaders and postdocs from different research groups and tours of the lab and radiotherapy department.
23 May	RSG retreat	24	The RSG retreat 2015 was held in Lunteren, preceding the BioSB conference. This event got the RSG funding. The program included two keynotes, student presentations and social activities.
22 June	BioCafe Wageningen	20	BioCafe in Wageningen organised in collaboration with the BioSB research school course “Quantitative and Predictive Modelling”. The program included a talk by Prof. Jaap Molenaar and a fun Bio-quiz.
3 September	Company visit The Hyve	20	Company visit to the Hyve, including a talk from the CEO and a tour of the company.
2016			
4 April	RSG retreat	33	The RSG retreat 2016 was held in Lunteren, preceding the BioSB conference. The program included a keynote lecture by Jonathan Karr, student presentations and social activities.
3 November	Company visit SkylineDx	10	We visited SkylineDx, a diagnostics company in Rotterdam. The program included talks by the CEO and the Head of Bioinformatics. We also held a session about the (dis)advantages of a career in industry vs academia.
10 November	Biocafe Amsterdam	7	We organized a Biocafe in Amsterdam during the ENPICOM course Python for Life Scientists.
2017			
7 February	Company visit Hartwig Medical Foundation	15	We visited the Hartwig Medical Foundation, where the program included a talk by the director of HMF and a tour of their sequencing facility.

Upcoming events

In 2017 we will also hold the RSG retreat preceding the BioSB conference in April. Among the other events we have coming up are a soft skills event (March) and a reproducible science workshop (May). Here students and young researchers can learn how to sell their science and ensure reproducibility. One of our focus points is to organize events that teach skills that are essential for a good scientist, but not regularly taught at university.

Contact information

E-mail: rsg-netherlands@iscbsc.org
Website: www.youngcb.nl

BioSB Newsletter

The BioSB Newsletters are being sent to the BioSB mailing list (1124 subscribers) and are also available on the BioSB website. In addition we have an additional BioSB-PI mailing list (126 PIs) for specific cases where we want to communicate with BioSB PI's only.

2017

- Upcoming courses & events, February 2017

2016

- BioSB newsletter, December 2016
- BioSB courses & events update October 2016
- BioSB newsletter July 2016
- BioSB Course update: Algorithms for Biological Networks – April 25, 2016
- BioSB Course update: Python for life scientists – April 22, 2016
- BioSB Course update: In silico life: constraint-based modelling at genome scale (first edition) – April 15, 2016
- BioSB Course update: Kick-start R – April 4, 2016
- BioSB newsletter February 2016

2015

- BioSB courses & events update October 2015
- BioSB courses & events update September 2015
- BioSB courses & events update July 2015
- BioSB newsletter June 2015
- Course update April 2015
- Course update March 2015

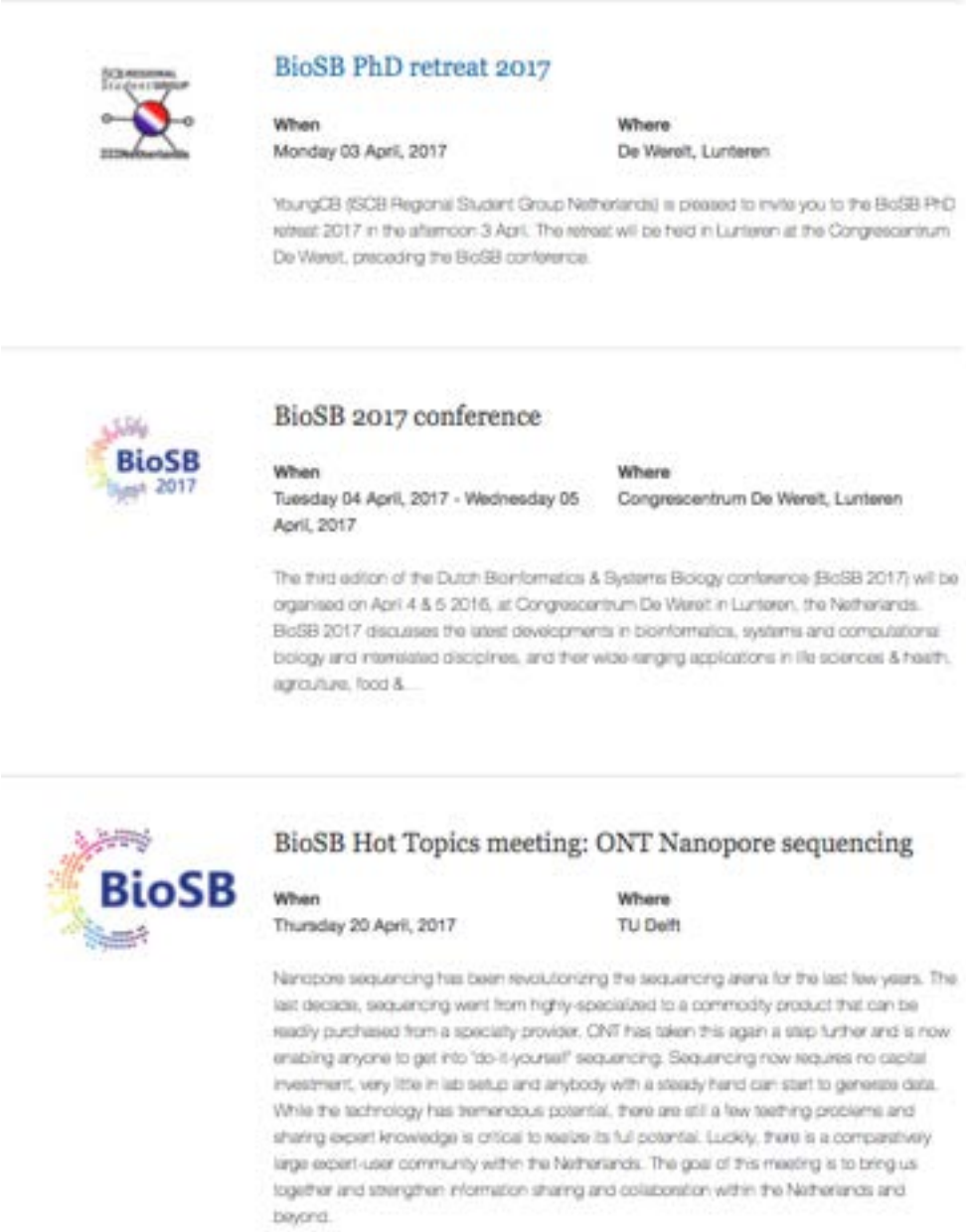
2014

- BioSB newsletter June 2014
- BioSB newsletter February 2014

BioSB Event Calendar

The BioSB event calendar shows the upcoming activities organised by BioSB and BioSB partners, as well as a selection of events and courses relevant for the bioinformatics and systems biology community. If you want to announce your event or course please mail us at education@biosb.nl. Additional information bioinformatics and systems biology events and courses worldwide can be found at the 'International events' page (collected via iAnn). The DTL Course overview provides a searchable overview of courses, trainings and workshops at the intersection of life sciences and high-end technologies. Past events can be found in the event archive.

Below a snippet of the BioSB event calendar page is shown.



BioSB Education programme

BioSB course portfolio

The BioSB education programme covers essential topics of the wide-ranging fields of bioinformatics and systems biology. It offers a wide variety of training courses that enable life scientists to apply modelling and computational approaches in addressing scientific challenges.

The programme consists of three types of courses:

1. **Introductory courses**
   Courses intended for novices. These courses can either be face-to-face or e-learning courses. The format differs per course. The course length ranges from 1 to 5 days. The frequency varies, but the aim is to have these courses at least once a year.

2. **Core courses**
   Courses for PhD students and other researchers in bioinformatics and systems biology. The topics and themes in the core programme form a coherent curriculum. The courses have a format of 5 days, with additional extra work (before and after) with a total study load of 3 EC. These courses will be offered once per two years.

3. **Specific courses**
   Other courses and workshops that do not fit in the above-mentioned categories. These courses may have a different format and be offered occasionally only. Furthermore, they are often co-organized with other organisations.

Below an overview is given of all BioSB courses. For each course, a link is given to the full course information.

In addition, a synopsis of the BioSB Course portfolio is given in the following chapter and is also available on the BioSB website (Education Programme (pdf)), with information about all courses, including coordinators, previous editions, expected date and a short course description.

Course table

BioSB Introductory courses **Intended for novices; course duration 3-5 days; course frequency: once per year**	**Last edition**	**Next edition** **Pre-register**
Programming in Python		tba
Kick start R	Apr 2016	19 May 2017
Programming in Matlab	March 2017	2018
Discovering Systems Biology Principles	Nov 2015	
eCourse Biomolecular principles of the Cell	2013	tba
eCourse Modelling of Biological Processes	2013	tba
eCourse Elementary Calculus in Systems Biology	2013	tba

BioSB Core Courses *Core programme for PhDs in Bioinformatics & Systems Biology; course duration: 5 days; course frequency: once per 2 years; course credits: 3 ECTS*	Last edition	Next edition Pre-register
Pattern Recognition	March 2015	25-29 Sept 2017
Managing & Integrating Information in the Life Sciences	Nov-Dec 2015	2017
Optimisation Techniques in Bioinformatics and Systems Biology	May 2010	2017
Multi-scale modelling		2017
Comparative Genomics: from Evolution to Function	Nov 2016	2018
Protein Structures: Production, Prowess, Power, Promises and Problems	Nov 2015	Oct 30- Nov 3 2017
Algorithms for Biological Networks	May 2016	2018
Quantitative and Predictive Modelling	Jun 2015	26-30 June 2017
Bios Specific courses **Course duration: 1-5 days; Course frequency: irregular**	Last edition	Next edition Pre-register
Python course for Life Scientists	Nov 2016	tba
Constraint-Based Modelling	May 2016	2018
Exploring System Properties Using Various Modelling Approaches		tba
Systems Medicine: Modelling Epigenetics	Febr 2016	
Metagenomics applications and Data Analysis	March 2014	2017
RNA-seq Data Analysis	Sept 2016	2017
Advanced de novo assembly and resolving complex genomic regions	Jun 2015	
EPS Postgraduate course 'Genome Assembly'	April 2015	
NGS in Diagnostics course: Genome resequencing in a Medical Diagnostic Context	Sept 2016	19-21 Sept 2017
Next-generation sequence data analysis	Aug 2016	
Data Integration in the Life Sciences	Febr 2015	
Life Sciences with Industry	Nov 2015	Febr 2017
Biological Network Analysis	Sept 2015	

BioSB Education Programme

Version March 2017

Introduction

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3. **Specific courses**
   Other courses and workshops that do not fit in the above-mentioned categories. These courses may have a different format and be offered occasionally only (e.g. summerschools). Some of them have successive editions while others may be one-time only events.

The BioSB education programme builds on the training programmes developed over the past years by the Netherlands Bioinformatics Centre , the Netherlands Consortium for Systems Biology , and their partners. The large group of tutors and staff that is already involved and the best practices that have been developed constitute a solid basis for the BioSB research school.

This document gives an overview of the BioSB Education Programme. For each course, brief information is given about the course, and the upcoming and earlier editions. Also the reference is given to the full course information (webpage). In addition, on the BioSB website, the BioSB Course Portfolio Page gives access to up to date information about the dates of upcoming courses and also provides links to the specific course pages for each course. For courses that are not open for registration it is possible to pre-register to indicate your interest for this course, after which you will get notified when the course is open for registration.

Many of the courses shown are being organised by BioSB in collaboration with other organisations. Existing collaborations and/or partnerships with other research schools and graduate schools, such as ASCI (www.asci.tudelft.nl), EPS (www.graduateschool-eps.info), PE&RC (www.pe-rc.nl), Molmed (www.molmed.nl), MCISB (www.mcisb.org), and the Groningen Graduate School of Medical Sciences (http://www.rug.nl/research/gradschool-medical-sciences/) will be extended and new partnerships will be established.

BioSB Course Portfolio

Introductory courses *1- 5-days; once per year*
Programming in Python Kick-start R Programming in Matlab
E-course Biology E-course Modelling E-course Calculus
Discovering Systems Biology Principles

Core Courses *5-days; once per 2 years; 3 ECTS*
Pattern Recognition
Managing and Integrating Information in the Life Sciences
Optimisation Techniques in Bioinformatics and Systems Biology
Multi-scale modelling
Comparative Genomics: from Evolution to Function
Protein Structures: Production, Prowess, Power, Promises, and Problems
Algorithms for Biological Networks
Quantitative and Predictive Modelling

Specific courses *1-5-days; frequency more irregular*
Regular Courses with successive editions
Constraint-Based Modelling
Metagenomics applications and Data Analysis
RNA-seq Data Analysis
NGS in DNA Diagnostics
Next-generation sequence data analysis
Life Sciences with Industry
Python for Life Scientists
Systems Medicine: Modelling epigenetics
One time only and/or few editions
Exploring System Properties Using Various Modelling Approaches
Advanced de novo assembly and resolving complex genomic regions
EPS Postgraduate course 'Genome Assembly'
Data Integration in the Life Sciences
Biological Network Analysis

Note: the purple highlights indicate courses in which bioinformatics and systems biology approaches are fully integrated.

BioSB Introductory courses

Programming in Python

Note: See below for Python course in the BioSB Specific Courses Track

Coordinators <names>
Dates <yyyyMMdd> (previous editions: none)
Venue <venue>
Website <www>
Study load 1 EC
Description/Keywords
Programming principles, software tools, Python.

Kick-start R

Coordinator Douwe Molenaar (VU)
Date 19 May 2017 (previous editions: 2012, 2013, 2014, 2015)
Venue VU University, Amsterdam
Website http://biosb.nl/education/course-portfolio/course-kick-start-r/
Study load 1 EC
Description/Keywords
This is a one-day introduction to the possibilities of the statistical calculation environment R for those who would like to use it, or have already started using R for statistical data analysis but would like to obtain a bit more background. We will start with a lecture in which the philosophy behind the R-language will be explained. An understanding of the data structures in R allows you to work more efficiently with R. We will show some of the advanced possibilities of R as well as where to find tutorials if you want to know more about those techniques. Most of the day will be devoted to a hands-on tutorial. The tutorial contains material from an introductory master course that is taught at the VU University. The manual contains material and references to material for self-study.
Topics that we will discuss: R language basics, installing R and R-packages, finding help, using R-studio, making dynamic reports, model fitting, reading/writing data from/to files, making publication-ready graphs, books and tutorials on the use of R.

Programming in Matlab

Coordinator Hans Stigter (WUR)
Date March 13, 2017 (previous edition: 2015)
Venue Wageningen
Website http://biosb.nl/education/course-portfolio-2/course-matlab/
Study load 1 EC
Description/Keywords
This is a one-day introduction to the possibilities of Matlab as a programming environment for simulation and analysis of biological models. We will start with a simple introduction of the basics of Matlab (matrices, vectors, manipulation of matrices and presentation of data). Having obtained some basic programming knowledge (writing of simple scripts and functions in Matlab), we will move on to more advanced topics. These include programming and solving ordinary differential equation models (ODEs) and the concept of “vectorized thinking” while writing Matlab-code. Finally, calibration of parameters in ODE type of models using measured data will be discussed and examples will be given. The course also includes the basics of presenting your results (graphing) in various types of plots that can easily be drawn in Matlab. Participants will, of course, get hands-on experience with Matlab and write code themselves in a practical.
Keywords: Programming principles, software tools, Matlab.

E-course Biology: Biomolecular Principles of the Cell ('basic biology for non-biologists')

Coordinator Bert Groen
Dates continuous, can be started any time (previous: 2009-2013) [*temporarily on hold*]
Venue Internet
Website http://biosb.nl/education/course-portfolio-2/biosb-ecourses/
Study load 3 EC
Description/Keywords

This e-course gives scientists that have no training in biology an introduction in basic biomolecular and cell biological concepts. The e-courses are fully web-based and are carried out individually. They consist of (a) readings, (b) recorded lectures, (c) assignments to monitor progress and (d) online-interaction with a tutor.

E-course Modelling: Modelling of Biological Processes ('basic modelling for biologists')

Coordinator Hans Stigter (WUR)
Dates continuous, can be started any time (previous: 2009-2013) [*temporarily on hold; will be available in 2017*]
Venue Internet
Website http://biosb.nl/education/course-portfolio-2/ecourse-modelling/
Study load 3 EC
Description/Keywords

This module introduces biologists to basic quantitative modelling. The e-courses are fully web-based and are carried out individually. They consist of (a) readings, (b) recorded lectures, (c) assignments to monitor progress, and, (d) online-interaction with a tutor.

E-course Calculus: Elementary Calculus in Systems Biology

Coordinator Hans Stigter (WUR)
Dates continuous, can be started any time (previous: 2012- 2013) [*temporarily on hold; will be available in 2017*]
Venue Internet
Website http://biosb.nl/education/course-portfolio-2/ecourse-calculus/
Study load 3 EC
Description/Keywords

This e-course provides a basic introduction to some mathematical concepts such as the derivative of a function, power series and Taylor series, the chain rule of differentiation, and more.
The aim of this e-course is to prepare students for the type of mathematics that, ultimately, can be used to create a mathematical model of a biological system. This e-course can therefore also be considered as an introduction to the e-course 2 on 'Modelling of Biological Processes'.
The e-courses are fully web-based and are carried out individually. They consist of (a) readings, (b) recorded lectures, (c) assignments to monitor progress, and, (d) online-interaction with a tutor.

Discovering Systems Biology Principles

Coordinators Frank Bruggeman (VU))
Dates 2017 (previous editions: 2015)
Venue Science Building, VU University, De Boelelaan 1085, 1081HV Amsterdam
Website http://biosb.nl/education/course-portfolio-2/course-discovering-systems-biology-principles/
Study load 3 EC
Description/Keywords
This course enables the student to discover biological principles that underlie biological networks. The course will first acquaint the student with the concepts of concentrations, rates, fluxes, steady state, production and transport. Several phenomena will be explained based on these biological principles: (i) production and transport are correlated, (ii) fluxes in a network may be correlated at steady state, (iii) control of function tends to be distributed (no rate-limiting step), (iv) networks may engage in energy waste through futile cycling, (v) cell function may be regulated at the level of transcription, translation, signalling and metabolism at the same time to different extents, (vii) networks may have multiple steady states and lead to pattern formation, (viii) drug targets may not be where they are traditionally expected, (ix) networks enhance robustness and engage in (near) prefect adaptation. The course will use existing models of relevant networks which the student will interrogate using the web-based live model repository JWS. No mathematical experience is required.
Emergence of function, in silico discovery, network principles, cooperativity, control and regulation of cell function, self-organization, principles of biology.

BioSB Core courses

Pattern Recognition

Coordinators Perry Moerland (UvA), Dick de Ridder (WUR), Lodewyk Wessels (NKI, TUD)
Dates 25-29 September 2017 (previous editions: 2009, 2011, 2013, 2015)
Venue Amsterdam
Website http://biosb.nl/education/course-portfolio/pattern-recognition
Study load 3 EC
Description/Keywords
The course introduces basic techniques from the fields of pattern recognition and machine learning to solve bioinformatics problems. After having followed this course, a student should have an overview of basic pattern recognition techniques and be able to recognize what method is most applicable to classification problems (s)he encounters in bioinformatics applications.
Full description: Many problems in bioinformatics require classification: prediction of the class to which a certain object (i.e. a gene, protein, cell, patient, ?) belongs. This calls for algorithms that can assign the most likely label (discrete output) to an object, given one or more measurements on that object. For most interesting problems, the underlying physics are too complex to explicitly formulate such an algorithm. In such cases, a machine learning approach is taken: an algorithm is constructed, with parameters that are tuned based on an available dataset of training examples. The algorithm should predict the labels for these examples as well as possible, yet still generalize, i.e. perform well on objects not seen before. Some examples of classification problems in bioinformatics are gene finding (sequence in, gene presence out), diagnostics (microarray data in, diagnosis out), data integration (measurements in, probability of interaction out), etc. In this course, we will introduce basic techniques from the fields of pattern recognition and machine learning to solve such problems. We will introduce the pattern recognition pipeline: measuring, feature extraction and selection, classification and evaluation. The first two days will introduce the basic classification problem and a number of classic approaches to solve it. Next, methods for selecting or extracting informative

features from a large set of measurements will be introduced. This will be followed by an introduction to a number of unsupervised techniques, that allow to find natural groupings or probabilistic descriptions of (unlabeled) data. The course will end with a cursory introduction to a number of intricate classifiers, artificial neural networks and support vector machines, and an overview of approaches to solve the generalization problem. For a large number of the methods discussed, we will turn to recent bioinformatics literature for examples.

Managing and Integrating Information in the Life Sciences
Coordinators Marco Roos (LUMC), Katy Wolstencroft (UL)
Dates 2017 (previous editions: 2009, 2011, 2013, 2015)
Venue Utrecht
Website http://biosb.nl/education/course-portfolio/course-managing-and-integrating-information-in-the-life-sciences/
Study load 3 EC
Description/Keywords
This course introduces modern techniques for the management of life science data and knowledge for bioinformatics applications. After following this course students should be able to start creating their first applications based on these technologies or make more informed design decisions for their current application. In this course participants will learn about:

1. Linked Data and the Semantic Web technologies that underpin it
2. How you can use Linked Data for data and knowledge integration in the Life Sciences
3. Available Linked Data resources in the public domain and large-scale projects that use these resources
4. How you can integrate your own data with Linked Data resources
5. How you can combine data integration and analysis over distributed resources, using Web Services and workflows

Optimisation techniques in Bioinformatics and Systems Biology
Coordinators Jaap Kaandorp (UvA), Jaap Molenaar(WU), Hans Stigter (WU), Cajo ter Braak (WU)
Dates TBA (previous edition: 2010)
Venue TBA
Website www.nbic.nl/education/nbic-phd-school/course-schedule/optimisation-techniques
Study load 3 EC
Description/Keywords
In many different problems from bioinformatics and systems biology (e.g. multi parameter estimation, reverse engineering of gene networks, multi-alignment problem, 3D structure prediction etc.) various optimisation methods are applied. In this course you will get acquainted with the underlying mathematics of optimization and with a selection of local and global optimization methods. In addition, throughout this course a great variety of examples of optimization problems in life sciences will be presented and discussed.
Day 1: math refresher and univariate optimisation
Dag 2: local multivariate optimisation
Dag 3: global stochastic optimization (simulated annealing, evolutionary algorithms)
Dag 4: parameter estimation, systems control and optimisation
Dag 5: MCMC techniques

Multi-Scale Modelling
Coordinators Roeland Merks (UL, CWI), Matthias Reuss (University of Stuttgart, DE)
Dates 2017 (previous editions: 2012, 2013, 2014)
Venue TBA
Website TBA
Study load 3 EC
Description/Keywords
Connecting different aggregation levels, spatial models, patterning, tissue modelling, physiology-based PK/PD modelling.

Comparative Genomics: from Evolution to Function

Coordinators Berend Snel (UU), Martijn Huynen (Radboudumc), Jaap Heringa (VU)
Dates 2018 (previous editions: 2011, 2014, 2016)
Venue TBA
Website http://biosb.nl/education/course-portfolio/course-comparative-genomics/
Study load 3 EC
Description/Keywords
Comparative genomics between species and between types of data facilitates the understanding of what these data really reflect about the underlying biological processes. Comparative genomics therewith relies on a solid understanding of basic elements of Bioinformatics like homology and orthology. Moreover it is important to know the assumptions and heuristics of bioinformatic methods for comparative genomics and hence we aim to let participants develop an understanding of why these methods sometimes fail (or misdetect) as a consequence of a variety of biological /evolutionary causes, and in which situations which method is most appropriate. The first two days of the course provide a basis for the course with the aim to move "beyond blast" in terms of the most sensitive homology searches, domain level analysis of protein evolution as well as more fine grained definitions of relatedness as can be obtained from the proper interpretation of gene trees (i.e. various levels of orthology). This foundation is used to discuss in the three following days in more detail three topics: (1) the study of functional and evolutionary consequence of (genome) duplications, (2) the evolution of interactions and complexes and (3) the prediction and evolution of genomic regulatory elements and of RNA structures.

Protein Structures: Production, Prowess, Power, Promises, and Problems

Coordinators Gert Vriend (Radboudumc), Daniel Hoffmann (University Duisburg/Essen, DE)
Dates Oct 30 – Nov 3 2017 (previous editions: 2011, 2013, 2015)
Venue Nijmegen
Website http://biosb.nl/education/course-portfolio/protein-structures-production-prowess-power-promises-and-problems/
Study load 3 EC
Description/Keywords
In the right hands, protein structures are a 'power'ful tool to answer bio-molecular questions. Knowledge of the structure is a pre-requisite for rational drug design, for biotechnology, for chemical biology, and for answering a whole series of biomedical questions. In this course we will discuss the 'production' of protein structures by NMR, X-ray, and homology modelling. These methods all have their pro's and cons so a certain 'prowess' is needed to follow all 'promises' and start attacking bio-medical 'problems' using protein structures. The course is split in three parts:
Part 1) Looking and seeing things in protein structures, learning to operate the software, understanding some of the algorithms.
Part 2) Protein structure determination (prediction) with NMR, X-ray, and homology modelling, and the possibilities and problems that come with each of these three techniques.

Part 3) Applying all that was learned in real-life example studies.
Keywords: Protein structure visualisation, analysis and scientific application.

Algorithms for Biological Networks

Coordinators Jeroen de Ridder (UMCU), Dick de Ridder (WUR), Marcel Reinders (TUD)
Dates 2018 (previous editions: 2010, 2012, 2014, 2016)
Venue Delft
Website http://biosb.nl/education/course-portfolio/course-algorithms-for-biological-networks
Study load 3 EC
Description/Keywords
In this course, we will first give a brief overview of molecular biology, the advent of high-throughput measurement techniques and large databases containing biological knowledge, and the importance of networks to model all this. We will highlight a number of peculiar features of biological networks. Next, a number of basic network models (linear, Boolean, Bayesian) will be discussed, as well as methods of inferring these from observed measurement data. A number of alternative network models more suited for high-level simulation of cellular behaviour will also be introduced. Building on the network inference methods, a number of ways of integrating various data sources and databases to refine biological networks will be discussed, with specific attention to the use of sequence information to refine transcription regulation networks. Finally, we will give some examples of algorithms exploiting the networks found to learn about biology, specifically for inspecting protein interaction networks and for finding active sub networks.
Keywords: Properties of biological networks, Network inference, Alternative network models, Integrative bioinformatics, Network algorithms.

Quantitative and Predictive Modelling

Coordinators Jaap Molenaar (WUR), Natal van Riel (TUE)
Dates June 26-30 2017 (previous editions: 2015)
Venue Wageningen
Website http://biosb.nl/education/course-portfolio-2/course-quantitative-and-predictive-modelling/
Study load 3 EC
Description/Keywords
In this Quantitative and Predictive Modelling course the participants learn how to describe the dynamic behaviour of biological systems and to integrate experimental data. Concepts of modelling are introduced via a great variety of examples taken from diverse practices. The emphasis is on providing an introduction into modelling approaches rather than an in-depth treatment of a few techniques. So, the course provides a broad overview of Modelling in the Life Sciences and is as such useful for a broad audience. The course is a mixture of theory sessions and computer practicals. During the practicals Matlab is used. Participants not acquainted with Matlab will get an introduction. The course has to be completed with assignments in the form of practical exercises as homework afterwards.

BioSB Specific courses

In the Specific courses track we identify two types of courses:

- Courses that occur regularly and have or have had several successive editions
- Courses that will occur or have occurred one time only or a few times in the past.

BioSB Specific Courses - regular courses with successive editions

In silico life: constraint-based modelling at genome scale

Coordinators Bas Teusink (VU), Brett Olivier (VU)
Dates 2018 (previous edition: 2016)
Venue Amsterdam
Website http://biosb.nl/education/course-portfolio-2/course-constraint-based-modelling-course/

Description/Keywords
Metabolic modelling, Genome-Scale Metabolic Models, flux balance analysis. Constraint-based modelling is a powerful modelling methodology that is being used to model a diverse range of biological phenomena. These include both fundamental and applied questions relevant to biotechnology, microbiology and medicine. Central to constraint-based modelling is the use of a genome-scale reconstructions (GSR's) that maps out the metabolism of a cell as a biochemical reaction network. In this course you will be introduced to: techniques for the construction of a working GSR: tools, tricks and pitfalls; the underlying mathematical definition and description of a constraint-based model; methods for interrogating models and interpreting results, such as Flux Balance Analysis and Flux Variability Analysis; software and standards

Metagenomics Applications and Data Analysis

Coordinators Sacha van Hijum (Radboudumc/NIZO), Bas Dutilh (UU). *For the 2017 edition, new coordinators will be identified.*
Dates 2017 (previous editions: 2013, 2014)
Venue TBA
Website http://biosb.nl/education/course-portfolio/course-metagenomics-approaches-and-data-analysis

Description/Keywords
This metagenomics course covers metagenomics and metatranscriptomics of prokaryotes, eukaryotes and viruses. Topics are metagenomics-specific issues like calling taxa, functional annotation, metagenome assembly, and comparative Metagenomics.
Metagenomes, environmental sequencing, functional profiling, next-generation sequencing, NGS, comparative metagenomics, bacterial genomics, microbial ecology, taxonomy.

RNA-seq data analysis

Coordinators Peter-Bram 't Hoen (LUMC), Jan Oosting (LUMC)
Dates 2017 (previous editions: 2011, 2012, 2013, 2014, 2015, 2016)
Venue Leiden
Website http://biosb.nl/education/course-portfolio/rna-seq

Description/Keywords
This is an advanced course for people with experience in NGS. The course will consist of seminars and hands-on command line, Galaxy and R practicals and will cover the analysis pipelines for differential

transcript expression and variant calling. Examples will be taken from human and mouse studies. The course does not cover prokaryotic RNA profiling nor plant- and metagenomics aspects.
Course topics: RNA-seq experimental approaches, Alignment and de novo assembly, Statistics for differential gene expression, eQTL analysis and allele specific expression, Variant calling and RNA editing, Fusion transcript detection, Small RNA profiling, Software for RNA-seq data analysis.

NGS in DNA Diagnostics

Coordinators Jasper Saris (ErasmusMC), Christian Gilissen (Radboudumc), Rob van der Luijt (UMCU), Johan den Dunnen (LUMC)
Dates 19-21 Sept 2017 (previous editions: 2014, 2015, 2016)
Venue Rotterdam
Website http://biosb.nl/events/ngs-in-dna-diagnostics/
Description/Keywords
VKGL/VKGN 'NGS in DNA diagnostics' is a course aimed at Genomic Resequencing in a Medical Diagnostic Context, i.e. to apply Next Generation Sequencing data as diagnostic tool in the hospital. Lectures will be accompanied with hands-on exploration. Day 1 consists of an introduction to NGS techniques followed by specialized lectures on sample preparation, enrichment technologies and read mapping.
Day 2 will continue with lectures on variant calling, annotation and interpretation with a diagnostic emphasis applied to Gene Capturing Panels, Exome Screening and CNV analysis. The afternoon of Day 1 & Day 2 is reserved for workshops and software demonstrations. Real data will be used where possible in hands-on tutorials using both commercial and open source software. Day 3 focuses on impact of results in the lab and ethical and legal issues of NGS in the clinical application. Real-life applications of NGS in the clinic will be presented. A forum discussion between researchers and clinicians about mutual expectations, ethics, implications of NGS on diagnostics and data sharing concludes the day.

Next Generation Sequencing Data Analysis

Coordinators Jeroen Laros (LUMC), Wilfred van IJcken (ErasmusMC), Judith Boer (ErasmusMC), Johan den Dunnen (LUMC)
Dates 2017 (previous editions: 10 times during 2009-2016)
Venue Leiden
Website http://biosb.nl/events/course-next-generation-sequencing-ngs-data-analysis/
Description/Keywords
This course aims at PhD students, postdocs, and senior researchers who are interested in, planning, or already working with next-generation sequencing. We welcome researchers from both the genomics and bioinformatics fields. Currently available technologies as well as hardware and software solutions will be presented and discussed. The focus of the course will be on the data and ways to analyse these.

Life Sciences with Industry

Coordinators Roel van Driel (UvA), Gökhan Ertaylan (Maastricht University), Ellen Feddes (STW), Bas Teusink (UVA),
Dates April 3-7 2017 (previous editions: 2013, 2014, 2015)
Venue Oord Building, Lorentz Centre, Niels Bohrweg 2, 2333CA Leiden
Website http://biosb.nl/events/life-sciences-with-industry-2017/
Description/Keywords
Challenging R&D problems, formulated by (Dutch) life sciences companies, will be tackled by young researchers. They are expected to find creative solutions to real-life problems. Each R&D problem

will be tackled by a group of eight young scientists, supported by a senior researcher from academia or industry. On the last day, each group will present their solution of the problem that was tackled. Participants are expected to make new contacts and develop future job perspectives. Participants are PhD students and postdocs.

Systems Medicine: Modelling epigenetics

Coordinators Hans Westerhoff (UvA/VU), Barbara Bakker (UMCG/RUG) *[in collaboration with ISBE-NL]*
Dates TBA (previous editions: 2012, 2013, 2014, 2015, 2016)
Venue Amsterdam
Website http://biosb.nl/education/course-portfolio-2/course-systems-medicine/
Study load tbd
Description/Keywords
Metabolic syndrome, Multiscale modelling, Cancer modelling, Next generation sequencing, PK/PD modelling, personalised medicine based on genome wide maps and systems biology.

Python for Life Scientists

Coordinators Nicola Bonzanni (ENPICOM)
Dates TBA (previous editions: two times in 2016)
Venue Amsterdam
Website http://biosb.nl/events/python-for-life-scientists-2/
Description/Keywords
Tailored for life scientists with little or no prior programming experience, this course, organized by ENPICOM, is driven by real-life use cases. Participants will learn by doing, completing snippets of code that they will be able to reuse in their everyday tasks. Extensive use of IPython Notebook (Jupyter) will encourage to annotate and document the code, building the basis for sound and reproducible data analysis.

BioSB Specific Courses - One time only and/or limited number of editions

Exploring System Properties Using Various Modelling Approaches

Coordinators Jaap Molenaar (WUR), Christian Fleck (WUR)
Dates TBA (previous editions: none)
Venue Wageningen
Description/Keywords
In this course the most common modelling approaches are dealt with in more detail via realistic examples. At the same time the strong relation between the experimental limitations and the choice of modelling approach is dealt with. Metabolic, regulatory, signalling, population models are put in ODE form and analysed via steady states, stability, phase plane analysis, tipping points, etc.. It is discussed when stochasticity is important and how it can be included in a model. Experimental design and data integration are introduced. The concepts of multi-scale modelling are introduced. ODE models for metabolic, regulatory, signalling, population, and ecological processes, experimental design, data-integration, stochastic modelling, stochastic effects.

Data Integration in the Life Sciences

Coordinators Roel van Driel (UvA), Jaap Molenaar (WUR), Lodewyk Wessels (NKI, TUD), Hans Westerhoff (UvA/VU)
Dates 2015 February 02-06 (previous editions: none)
Venue Snellius Building, Lorentz Centre, Niels Bohrweg 1, 2333CA Leiden
Website http://biosb.nl/events/training-course-data-integration-in-the-life-sciences/

Description/Keywords
Biological systems function through the dynamic interplay of large numbers of components. At the molecular level these include genes, transcripts, proteins and metabolites. At higher organisational levels the main players are cells, tissues, organs and organisms. Understanding biological systems, for instance in the context of biomedical and industrial applications, requires combining multiple diverse data sets on all components and their interactions. This integration process is hampered by the fact that in modern data acquisition technologies each concentrates on one specific component of the system, e.g. a specific type of molecule. Proteomics, metabolomics and transcriptomics are examples. To overcome this hurdle novel approaches are being developed, enabling the integration of disparate data sets in ways that are biologically sound and that provide insight into the architecture and dynamics of biological systems.
The basic concept in this course is that diverse data sets can be integrated in predictive and quantitative computational models. Depending on the types of data and the research aim, optimal integration and modelling approaches must be selected. This training course is meant for PhD students and postdocs. It is organised in collaboration with ERASys*APP* (www.erasysapp.eu).

Biological Network Analysis

Coordinators Christian Rausch (VUmc), Gunnar Klau (VU & CWI), Martina Kutmon (Maastricht University)
Dates 2015 September 17-18 (previous editions none)
Venue Amsterdam
Website http://biosb.nl/events/biosb-course-biological-network-analysis/
Description/Keywords
The course will discuss the concepts of networks, and their application to biological examples like gene interaction networks, metabolic pathways, gene regulation- and signal transduction pathways. We will introduce the graphical programs PathVisio and Cytoscape and use it in the practical training for data visualization and analysis. We will use pathways from public resources like WikiPathways to create pathway visualizations and analyze experimental data. Furthermore, we will analyze differential gene expression data and will identify the affected metabolic (sub)pathways (KEGG/ gene ontology).

Advanced de novo assembly and resolving complex genomic regions

Coordinators Johan den Dunnen (LUMC), Yahya Anvar (LUMC)
Dates 2015 June 22-26 (previous edition: 2013)
Venue Leiden
Website http://biosb.nl/education/course-portfolio-2/course-advanced-de-novo-assembly-2nd-edition/
Description/Keywords
This course is targeted at PhD students and Postdocs in Life Sciences or Bioinformatics with basic knowledge of next-generation sequencing (NGS) technology and data analysis. This course covers topics on what every biologist should know about de novo assembly and study design, overview of available technologies and sampling strategies, methodologies and framework for de novo assembly (haploid and polyploid genomes), gap closure, quality assessment and functional annotation. In addition, we will showcase recent achievements, novel discoveries and current limitations in resolving complex genomes. The practical sessions are designed in such a way to promote lively discussions on how to design your study, the best practices, dos and don'ts, and provide you with an outlook on how to move from sequencing data to high-quality assembly and meaningful biological interpretation. After following this cou
rse, participants will gain insights on how to design a genome assembly study and will have an overview of challenges and various techniques to choose the most fitting strategy in order to

produce a high-quality genome assembly.

EPS Postgraduate course 'Genome Assembly'

Coordinators Gabino Sanchez-Perez (WUR), Sandra Smit (WUR), Hendrik-Jan Megens (WUR), Jan van Haarst (WUR)
Dates TBA (previous edition: 2013, 2015)
Venue Wageningen
Website http://biosb.nl/events/eps-postgraduate-course-genome-assembly-2nd-edition/
Description/Keywords
The aim of this course is to teach PhD students in the green life sciences about the process of genome assembly and annotation. We will cover topics such as sequencing technologies, assembly algorithms, genome annotation, assembly improvements, and assembly validation. The focus is on the assembly of (complex) eukaryotic genomes. After attending this course, students should understand the main sequencing technologies; understand which steps are involved in producing an annotated genome sequence; have an overview of relevant tools, or know where to find them; be able to understand genome papers (assembly terminology and common analyses);be able to do a small genome assembly using Galaxy.

BioSB Education Committee

Input for Review Committee, March 2017

Mission:
Our mission is to offer a rather complete programme of courses on topics and technologies that are indispensable for researchers in Bioinformatics and Systems Biology.

The Educational Programme of the BioSB PhD School has started as a merger of the educational programmes of the former NBIC and NCSB, but has considerably been extended since then.
Our courses are developed in close collaboration with the BioSB community in the Netherlands and are taught by leading experts in the field. The programme is accessible for BioSB members, but also welcomes other life sciences PhD students and researchers worldwide. The programme offers a wide variety of training courses that enable life scientists to apply modelling and computational approaches in addressing scientific challenges. The large group of tutors and staff that is already involved and the best practices that have been developed constitute a solid basis for the BioSB research school. The courses are advertized via the BioSB mailinglist, which comprises a list of life scientists that is much broader than only BioSB members. Many of the courses shown are being organised by BioSB in collaboration with other organisations. With several research schools and graduate schools such as ASCI (www.asci.tudelft.nl), EPS (www.graduateschool-eps.info), PE&RC (www.pe-rc.nl), Molmed (www.molmed.nl), MCISB (www.mcisb.org), cooperations already exist, but we intend to start new partnerships.

The Educational Committe has the following members:

Jaap Molenaar (Wageningen University, Chair)
Chris Evelo (University Maastricht)
Natal van Riel (Eindhoven University)
Dick de Ridder (Wageningen University)
Joske Ubels (Amsterdam, PhD))
Douwe Molenaar (Amsterdam University)
Celia van Gelder (BioSB, Secretary)

The plenary committee convenes 1 a 2 times a year to discuss the general aspects of the Educational Programme. In between the contacts are via e-mail.

During the BioSB 2016 Conference in April 2016 the EC organized, together with the Scientific Committee, an interactive session with the conference participants to get suggestions and feedback on the existing course programme via a number of propositions. Main conclusions:

- There is an urgent need for a course on Big Data
- Cooperation with other Research Schools should be intensified.

Ongoing and planned activities:

- The technical embedding of the online courses has changed. This turned out to be a major challenge.
- A new tutor for the eLearning cursus Biology has been found.
- A number of new teachers has been found for the course on 'Optimization'
- The contents of a course on Big Data is still under discussion. Setting up this course will be a combined enterprise with the scientific committee.
- The cooperation with the Research School PE&RC will be intensified.

- The need for a course on the basics of Bioinformatics is under discussion.

Key discussion point

Does the course programme cater for PhDs in Bioinformatics and/or Systems Biology in the sense that it provides sufficient training for PhDs to be considered well-equipped researchers in either or both fields. What are key elements of knowledge or skills they should acquire?

Course evaluations

A) Evaluation form Course Algorithms for Biological Networks 2016
B) Evaluation results - Course Algorithms for Biological Networks 2016

EVALUATION FORM

BioSB course: Algorithms for Biological Networks (4th edition)

May 23 – May 27, 2016, Delft, the Netherlands

We value your opinion very much. Please use the white spaces for additional comments. We will use your comments to improve future courses.

Please indicate: I am a: PhD student [ ] PostDoc [ ] Industry [ ] Other, please specify:

1. GENERAL: COURSE CONTENT & LEVEL

What is your opinion about the content and level of the course in general?

1. **Did the content of the course match your expectations?** Yes [ ] No [ ] **If no, what did you expect?**

2. **Did you miss certain topics?** Yes [ ] No [ ] **If yes, what topics did you miss?**

3. **Did the level of the course match your expectations?** Yes [ ] No [ ] **If no, what did you expect?**

4. **Did you feel your previous computer/bioinformatics expertise was sufficient to follow the computer exercises?** Yes [ ] No [ ]

2. DETAILED EVALUATION OF EACH COURSE DAY - What is your opinion on the individual lectures and (computer) exercises?

				Content of lectures & hands-on sessions			Presentation of lectures & hands-on sessions			Hands-on sessions	
	Speaker / Practical Supervisor	**My evaluation: 1=poor 10=excellent**	**I will use these techniques in my own research; yes/maybe/no**	**Below expect.**	**Suffi-cient**	**Eye-opener**	**Sub-optimal**	**Suffi-cient**	**Very clear**	**All programs/tools worked properly yes/no, if not please specify (use gray box)**	**Other feedback on the practical session**
Day 1: Monday May 23, 2016	**Jeroen de Ridder/Dick de Ridder**									* *Specifications (if applicable):*	
Lecture: Introduction											
Lecture: molecular biology											
Lecture: networks in molecular biology											
Lecture: network properties, topology and visualization											
Lab work											
Paper reading											

				Content of lectures & hands-on sessions			Presentation of lectures & hands-on sessions			Hands-on sessions	
	Speaker / Practical Supervisor	**My evaluation: 1=poor 10=excellent**	**I will use these techniques in my own research; yes/maybe/no**	**Below expect.**	**Suffi-cient**	**Eye-opener**	**Sub-optimal**	**Suffi-cient**	**Very clear**	**All programs/tools worked properly yes/no, if not please specify (use gray box)**	**Other feedback on the practical session**
Day 2: Tuesday May 24, 2016	**Dick de Ridder**									* *Specifications (if applicable):*	
Lecture/pitches: networks models and inference											
Lecture: data integration											
Lab work											
Paper reading											
Day 3: Wednesday May 25, 2016	**Jeroen de Ridder**									* *Specifications (if applicable):*	
Lecture / pitches: network clustering											
Lecture / pitches: network based analysis											
Lab work											
Applied paper reading and discussion											

				Content of lectures & hands-on sessions			Presentation of lectures & hands-on sessions			Hands-on sessions	
	Speaker / Practical Supervisor	**My evaluation: 1=poor 10=excellent**	**I will use these techniques in my own research; yes/maybe/no**	**Below expect.**	**Suffi-cient**	**Eye-opener**	**Sub-optimal**	**Suffi-cient**	**Very clear**	**All programs/tools worked properly yes/no, if not please specify (use gray box)**	**Other feedback on the practical session**
Day 4: Thursday May 26, 2016										* *Specifications (if applicable):*	
Lecture: networks and sequences	Aalt-Jan van Dijk										
Lecture: Petri nets	Anton Feenstra										
Practical: Petri nets	Anton Feenstra										
Day 5: Friday May 27, 2016										* *Specifications (if applicable):*	
Lectures: intracellular networks	Jaap Heringa										
Paper discussion: Petri nets	Anton Feenstra										

3. GENERAL: ORGANISATION, LOCATION, CATERING & ADDITIONAL COMMENTS

What is your opinion of the course organisation, location & catering?

Course Organisation

Poor [ ] Unsatisfactory [ ] Good [ ] Very good [ ]

Lecture rooms

Poor [ ] Unsatisfactory [ ] Good [ ] Very good [ ]

Computer facilities

Poor [ ] Unsatisfactory [ ] Good [ ] Very good [ ]

Catering

Poor [ ] Unsatisfactory [ ] Good [ ] Very good [ ]

4. What would be your overall score for the course ?

1	2	3	4	5	6	7	8	9	10

Do you have suggestions how we can improve the course next time, or how we can improve the Education Programme of the BioSB research school in general?

Thank you for filling in this form!
The BioSB education team (education@biosb.nl)

EVALUATION FORM

BioSB cours: Algorithms for Biological Networks (4th edition)

May 23-27, 2016, the Netherlands

We value your opinion very much. Please use the white spaces for additional comments. We will use your comments to improve future courses.

Please indicate: I am a: PhD student [11] PostDoc [ ] Industry [ ] Other, please specify [ ]:

1. GENERAL: COURSE CONTENT & LEVEL

What is your opinion about the content and level of the course in general?

a) Did the content of the course match your expectations? Yes [11] No [ ]

If no, what did you expect?

Maybe more hands-on labwork would be better to obtain more practical knowledge. Course was quite theoretical

b) Did you miss certain topics? Yes [2] No [8]

If yes, what topics did you miss?

GRN models and state graphs in more detail

I miss a bit certain hard core biology knowledge because of my background

c) Did the level of the course match your expectations? Yes [11] No [ ]

If no, what did you expect?

d) Did you feel your previous computer/bioinformatics expertise was sufficient to follow the computer exercises? Yes [11] No [ ]

2. DETAILED EVALUATION OF EACH COURSE DAY - What is your opinion on the individual lectures and (computer) exercises?

				Content of lectures & hands-on sessions			Presentation of lectures & hands-on sessions			Hands-on sessions	
	Speaker /	My evaluation:	I will use these techniques in my own research;	Below expect.	Suffi-cient	Eye-opener	Sub-optimal	Suffi-cient	Very clear	All programs/tools worked properly	Other feedback on practical session
	Practical	1=poor	yes/maybe/no								
	Supervisor	10=excellent									
Day 1: Monday	Jeroen de Ridder/Dick de										

| | | |

Lecture/pitches: network clustering		8,0	Yes: 6 Maybe: 3 No:	1	6	3	1	3	5		7 9 8 8 6 8 7 9 8 10
Lecture/pitches: network based analysis		8,2	Yes: 8 Maybe: No: 1	1	7	2		6	3		7 9 7 9 7 8 7 9 9 10
Lab work		7,7	Yes: 4 Maybe: 2 No:	3	5	2		6	3		7 7 7 8 7 8 8 7 10
Applied paper reading and discussion		8,0	Yes: 2 Maybe: 2 No: 1	1	7	2		5	4		7 7 7 8 7 9 8 10 9
SPECIFICATIONS HANDS-ON SESSIONS: Lectures better then pitches Same as Day 1 (not enough time) With a good introduction everything went smoothly Discussion was fun! *(degenen die allemaal 10-en geeft scoort alles op 'below expectations' bij content of lectures en hands-on sesions, misschien dus niet goed ingevuld?)*											
Day 4: Thursday May 26, 2016				**Below expectation**	**sufficient**	**eye-opener**	**sub optimal**	**sufficient**	**very clear**		
Lecture: networks and sequences	Aalt-Jan van Dijk	7,8	Yes: 3 Maybe: 2 No: 4	1	7	2	1	7	1		7 10 6 7 8 8 6 9 8 9
Lecture: Petri nets	Anton Feenstra	7,5	Yes: 1 Maybe: 6 No: 3	3	3	4	3	4	3		8 9 5 10 7 7 5 9 6 9
Practical: Petri nets	Anton Feenstra	7,6	Yes: Maybe: 6 No: 3	4	3	3	3	5	2		8 10 5 10 7 7 5 9 6 9
SPECIFICATIONS HANDS-ON SESSIONS: Why present case studies that are presented by students later? Petri nets practical: short time Description not very sounding/complete on the CS side made the lectures 'bumpy'											
Day 5: Friday May 2, 2016				**Below expectation**	**sufficient**	**eye-opener**	**sub optimal**	**sufficient**	**very clear**		
Lectures: intracellular networks	Jaap Heringa	8,7	Yes: 2 Maybe: 5 No: 1		8	2		5	5		9 10 8 9 8 9 8 8 9
Paper discussion: Petri nets	Anton Feenstra	6,9	Yes: Maybe: 4 No: 3	1	6	2	1	8			7 7 7 8 6 7 4 7 9
SPECIFICATIONS HANDS-ON SESSIONS: paper discussion: too much case study Too unstructured											

3. GENERAL: ORGANISATION, LOCATION, CATERING & ADDITIONAL COMMENTS

What is your opinion of the course organisation, location & catering?

Course Organisation
Poor [ ] Unsatisfactory [ ] Good [8] Very good [2]

Lecture rooms
Poor [ ] Unsatisfactory [ ] Good [6] Very good [4]

Computer facilities
Poor [ ] Unsatisfactory [ ] Good [8] Very good [1]

Catering
Poor [1] Unsatisfactory [1] Good [7] Very good [2]

What would be your overall score for the course? 8,222222222

8 8 8 8 8 8 9 8 9

Do you have suggestions how we can improve the course next time, or how we can improve the Education Programme of the BioSB research school in general?

* The pitches didn't work out well, especcially during Day 2. Very difficult problems were assigned to people that didn't manage to fully understand them during 1 afternoon. Also it took very long. It would be better if difficult topics were explained by teachers, not students. There should be more time for the lab work, so that after the course we could not only talk about networks in theory, but also apply them to our data. Other than that, the course was great, thanks!

* Paper reading very useful. Too much paper reading sometimes makes things boring and doesn't help in learning.
* We ran out of time a lot, I would have liked to spend more time on the computer labs. Pitches were a nice idea, but more explanation and context by the lectures is useful; Wednesday was better than Tuesday in that respect

* Paper reading/presentations was a bit too much. I think it would bring some more structure if it was a bit less. For example, 1 paper per day and dealing with the other material in lecture might not be bad. Now, I know that many students (including me) did not read both papers well every day but instead focus on the part we had to present. In this way, I didn't learn as much about the other subjects as could have been learned. Also presentations about the principles or algorithms are much more interesting than those about case studies that don't really go in-depth. Finally would be nice to have answerts to the lab exercises somewhere!

* Not enough time to do everything (exercises). And maybe focus more on methods of the papers. I liked the course very much though, keep it u
* I felt everything was a bit fast in the morning lectures but at least I now know where to look for specific methods/algorithms. Lots of reading and discussion was bit hard but had lots of input. The course was really interesting and will be useful for my future works.

Thank you for filling in this form!
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