BIO 208 Environmental Impact of Aquaculture - spring semester 2018, with notes on spring 2017 and summary of changes since 2014

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Course description

The content and objectives of the course are described as:

"Aquaculture supplies half of the total aquatic products for human consumption at the global scale. However, the production of aquaculture products has direct and indirect impacts on the environment, and the potential for negative impacts on human health. This course introduces the major sources of aquaculture impacts and their effects on the environment. The course will cover a wide spectrum of environmental issues resulting from expanding global aquaculture. These will include the competition for natural resources and the impact of direct organic pollution. Current issues are reviewed, and the risks and benefits of different systems are evaluated. The course will deal in depth with the impact of intensive aquaculture on wild fish populations, including the transfer of disease and parasites (sealice), the impact of escaped fish, and the threats and benefits of GM fish. Additional topics include habitat destruction, sourcing of feeds, antibiotic use, introduced species, and consumer knowledge.

The course content is based on lectures, selected reading material, and presentations by active researchers in the field. Learning activities include student-led discussions and short investigations. The evaluation of scientific literature and popular media is emphasized to encourage the development of critical thinking and the ability to articulate evidence-based opinions."

The learning outcomes are:

The course aims to give the students an understanding of the impact of aquaculture on a global scale.

- On completion, students will be able to identify and discuss the major biological impacts, including effects on surrounding biota and potential human health impacts
- will be able to identify and discuss the major physical impacts, including spatial conflicts linked to aquaculture sites
- will be able to identify and discuss the major sources and effects of chemical and nutrient inputs to the environment
- will be familiar with selected monitoring and management tools and updated trends in technological solutions
- will demonstrate critical thinking applied to sources of information about aquaculture impacts by finding relevant sources of information on aquaculture impacts representing different viewpoints
- Will be able to evaluate quality of information from scientific and general sources
- Will be able to develop an independent opinion on relevant issue, based on scientific information
- Will be able to express own opinion in a clear and concise manner, with correct notation of source material

Evaluation and grading:

As stated in the published course description, students are required to attend all group discussion sessions:

"Obligatorisk undervisningsaktivitet - Deltakelse i studentens diskusjoner og aktiviteter er obligatorisk" (<u>https://www.uib.no/emne/BIO208</u>)

"Compulsory Assignments and Attendance - Participation in student discussions and activities is compulsory" (<u>https://www.uib.no/en/course/BIO208</u>)

As stated in the published course description, students grades are based on:

"Vurderingsformer - Mappevaluering av skriftlige oppgaver (40%) og deltakelse i kursøvelser (30%) og hjemmeeksamen skriftlig eksamen (30%). " (<u>https://www.uib.no/emne/BIO208</u>)

"Forms of Assessment - Evaluation of written assignments (40%) and participation in class exercises (30%) and take-home written examination (30%)." (<u>https://www.uib.no/en/course/BIO208</u>)

Spring 2018 experience

This is a popular course for exchange students, with a final total of 33 students taking the examination. One student was sick during the exam and will retake it in autumn 2018. Compared to previous years, there was a higher proportion of undergraduate students, particularly those finishing the Bachelors in Sustainable Aquaculture. Master's level students included those following the aquaculture as well as the marine biology study programme. The majority of students were Norwegian (a result of the large number from the aquaculture programme), but students also came from Hong Kong, France, Germany, and Italy.



The mix of students that has been present in the class in 2015-2017 lent a considerable diversity to the discussion and also to the reading material that could be drawn on in the course. Having a majority of undergraduate students from a single study programme in 2018 was unexpected and if that trend continues then extra time may need to be allocated to cover the necessary skills in literature searching and referencing.

The course structure was not altered very much since the original revision in 2014; the original plan has been to devote one class meeting to lectures and one class meeting to student-led discussion in each week. Students were divided into eight groups (4-5 students each), each group responsible for leading two discussions during the semester. In addition to sourcing the reading material, they also summarized it for the class, led the discussion with prepared questions, and wrote individual essays on a selected issue within the topic. There were two parallel discussion sessions, each with three of the student groups - ca. 15 students in each. The groups stayed constant throughout the semester, but the teaching staff rotated so as to observe and evaluate participation and contributions. This format has performed well in previous years. In 2018, however, students seemed unaware that attendance and participation were obligatory (see course description above). They also seemed unaware that attendance and participation were part of the grade evaluation (see course description above). This is clear from the comments on the student survey course evaluation given at the end of this report. Although these course requirements were presented on the first day of the course, and were always available to the students in the Course Inroduction notes, the student comments make it clear that this needs to be repeated at regular intervals during the semester.

There were four guest lectures, and one of these also included a discussion session. The pensum was composed of scientific articles and essays, as well as the material sourced by students for their discussion sessions. A significant difference in 2018 has been the implementation of a new scheduling system which is intended to maximize the use of teaching rooms, and minimize the course clashes for students. Certain course combinations are highlighted, and a meeting schedule is automatically generated to avoid collisions. The outcome for BIO208 in 2018 was a patchy meeting schedule, where six of our usual course meetings were blocked off for other courses. As a result, the discussion session timing was not as optimal as it had been in other years, and we were not able to align the lecture topics and discussion topics within the same week, as in previous years.

The student grades were based on evaluation of written assignments (40%) and participation in class exercises (30%) and take-home written examination (30%). The weighting was changed in 2017 and 2018 to address concerns raised by students in previous years that there was not enough weight put on the written essays, and group work in general, compared to the weight for the final grade. In 2017 and in this year, 2018, the written assignments (40%) consisted of the individual essays and group reports, the class exercises (30%) consisted of group discussion participation (as participants and as leaders), and the take home exam (30%) is self-explanatory. In 2018, the length of the final exam was reduced by approximately 1/3, in response to student comments over

previous years about the length in relation to the value (weighting) of the exam. Nevertheless, it remained a large focus for negative student comments in 2018. Despite these concerns, it remains a major feature that the final take home exam serves to improve the grade for most students.

Final grades were distributed mostly in the A's and B's and reflect the attention and workhours put in by most of the students. The distribution has been similar over the past 5 years. Students estimated that they spent 18 hours per week on coursework, similar to the figure given in 2017.



Addressing issues from 2016-2017

Several comments in the student surveys from 2016 were addressed and improvements were noted:

- 1) The room assigned for the course was changed for 2017 and 2018 to a flexible conference room with a removable dividing wall. This was very successful from the teachers point of view, but may have contributed to student's comments about lack of organization since we often had to re-arrange tables and chairs at the start of class
- 2) The participation of teaching assistants who had experience of the course over two years (started in 2017) made an enormous difference to the learning experience. This made it possible to return feedback on the written work more quickly.
- 3) More opportunity was given to practice writing during the whole semester and more feedback on the writing was provided
- 4) The evaluation criteria was made more explicit; with clear instructions for how the written work was marked, what weight was given to the different evaluation modes. In 2016 we changed to using the Canvas platform, and that allowed in 2017 and 2018 for repetition of the instructions for each assignment, as well as a visible grading rubric for evaluating the students' work.

The marking information given for the written work (essays of 1000-1500 words) was again announced:

How BIO 208 Essays are graded:

Total possible 100 points:

20 points- Introduction – clear statement of the topic, how it relates to the course (or you) and which aspects you want to focus on. Clear statement of the intended approach to explore the topic and what will be emphasized. What do you expect to find?

50 points- Main text –paragraphs with clearly described relevant topics, well referenced. The facts must be correct and cited. Develop your opinion and back it up with facts

20 points Conclusions – clear statement of what the previous text has brought to light *including what has not been investigated* (either by you or by the literature). State whether your initial impression of the topic (from Introduction) has been supported or undermined by the research. State what you think seems to be the next step in looking at this topic.
 10 points References – all properly cited and in the same consistent format (eg Harvard style or similar). All references are

mentioned in the text and all text references are found in the list. Remember to give the accessed date for internet resources. Papers cited in a review article use the review article as the reference.

To reinforce this, the first discussion session was led by the teaching staff, presenting three selected essays (sourced from the internet and from Nature) on aquaculture as a demonstration of what to do and what not to do.

Student Evaluations and course changes since 2014

Overall the course is evolving in a positive way and the level of accomplishment and satisfaction on the part of the students is encouraging. The guest lecturers have reported that they have enjoyed participating and look forward to doing so again next year. We will continue to modify the content to incorporate new advances in the field, and changes in the other courses offered at BIO. It was a big improvement to share the teaching this year, and it would be a good idea to increase the teaching team further, as well as inviting the guest lecturers into the planning group.





The most critical comments made by the students in their evaluation in past years were directed at the discussion sessions. Many students do not like to take responsibility for their own learning and thus ask for more lectures. Fortunately, many more students were enthusiastic about the freedom to follow their interests and explore the topics. Most students commented that they felt a real sense of accomplishment, and appreciated how much they had learned. In 2017 and 2018 the group work evaluation was based more on individual contributions. The hope was that this would counteract the cases where not all group members were participating fully. The combination of oral and written work is still considered the best way to compensate for group dynamics and for personalities (shy vs extrovert). The suggestion that group members should evaluate each other, has not been implemented yet.

Student survey results (2017)









Hva likte du mest med dette emnet?

- Diskusjonene
 The discussions
- The exam was like assignments. I learnt more than a traditional exam and I kept more knowledge.
- Fokus på overførbar kunnskap i form av skrivetrening, bruk av vitskapleg litteratur osv...
- Hva likte du minst med dette emnet?
- Mengden stoff som måtte lese
- The home exam
- · The amount of essays.
- Skelvfordeling av arbeidsinnsats innad i gruppa
- Har du forslag til hvordan emnet kan forbedres?
- · Not a really etensive home exam on the sunniest weekend of the semester. No, but really I thought the exam was a little too much work considering it was only 30 percent of the grade.
- · Do not give demand essays without to be on calendar
- Dette er ikke deres ansvar alene, men jeg synes at det generelt bør bli strengere krav til forkunnskaper i engelsk for utvekslingsstudenter på UIB. Dette er et gjennomgående problem i emner som involverer mye gruppearbeid.
- Tilbakemeldinger på organisert praktisk undervisning?

 Fun and I learnt a lot. Maybe the instructors could have hjelped to keep the discussions "alive" a little more often
- · Was hard to meet all members of the group in group meetings.
- Likte veldig godt at det ble brukt så mange ulike undervisningsformer.



Hvordan vil du totalt sett evaluere underviseren(e)?



Student evaluation of BIO208 in 2017 was done in cooperation with BioCEED and looked specifically at participation in oral discussions. The final exam was given in May, and the evaluation survey sent to the students in late June – it is likely that the very low response rate is because of the long interval before contacting the students for feedback

Student evaluation of BIO208 – 2018 (20 answers of 34 students)







Hvordan vil du evaluere emnet som helhet?



Hva likte du mest med dette emnet?

- At det var lagt opp på en annen måte enn andre fag. Mye samarbeid med andre medelever, ikke på den tradisjonelle måten at vi kun møter i forelesning hvor foreleser står og snakker. Mer aktivt læringsmiljø.
- Mye smarbeid, bedre på å skrive
- Meir komfortabel til å snakke opent, diskutere og bruke engelsk
- Kunnskap om oppdrett andre plasser enn Norge Ternaene og pensum var veldig relevant for mitt studie .
- · Ble mer komfortabel med å uttrykke meg mundtlig
- Gode diskusjoner ga masse erfaring muntlig på engelsk. God øving for skriving på engelsk. Mye aktuelle saker fra
- oppdrettsnæringen Interventions of different speakers
- . Broadening our aquaculutre knowledge horizon. Forcing us to do our own research and present our findings. Discussions and oral presentations in general is always a good thing in my opinion.

Kevin Glover and Dorothy Dankel were excellent additions, I loved their input.

- Shad gave incredibly useful and in-depth feedback on the essays. The diversity of the themes that were covered
- .
- Discussion groups .
- The scope and focus on scientific articles.
- Besøket til Donald Glover minus at vi skulle presentere hans arbeid til han. Vi hadde lært sååå mye mer om han hadde forelest for oss
- . Forelesninger og diskusjonstimene, samt at vi fikk god øving i å skrive essays, delta i debatt og i å lese artikler
- Fremføringer
- i think the lecturers and course coordinators were very knowledgeable and engaged with the topic, for me a lot of new facts were presented and we looked at problems i had been mostly unaware of until then
- Godt for skriveteknikk

Greie diskusjone

· The throughout focus on writing and reading scientific articles while being critical of its content.

- Hva likte du minst med dette emnet?
- Informasjon kunne blitt gitt mer tydelig. Oppgaver kunne komme noe brått på. Eksamen var også veldig stor. Uklar informasjon om hva som skal bli gjort i de ulike innleveringene.
- For stor eksamen i forhold til tiden.
- . Emnet har tatt for mye tid og gått ut over andre emner jeg har hatt dette semesteret. Synes lite om at diskusjonene blir karaktersatt, da de ikke er obligatorisk, og det ikke har vært mulig å møte på alle grunnet andre emner som har hatt mye obligatorisk oppmøte. Eksamen ble lagt ut før eksamenstiden, og dette ble begrunnet med at det var eksempeloppgaver, men etter litt tid var disse lukket for åpning. Mistenker derfor at disse oppgavene ble lagt ved en feil, og at studentene ikke skulle ha tilgang til å åpne de. Dette blir urettferdig for de studentene som hadde den første eksamen, med tanke på tid. Oppgavene var riktig nok byttet noe om på, men studentene med sen eksamen fikk bedre tid til å lete opp relevante artikler knyttet til de emnene som er sannsynlig å dukke opp på eksam
- Uorganisert
- Lite struktur og til tider rotete opplegg. Også veldig krevende avsluttende eksamen med tanke på mengde ord og tid.

· Kafka-esque chaos. I was so frustrated by the lack of organization, conflicting information, arbitrary scores, etc., I was convinced it was done on purpose to "test our character", or similar, by the end. Please stop giving three conflicting statements and surprising and overwhelming people with additional work last minute

I was looking forward to taking this class, but the frustration of dealing with the unorganized nature of it kind of ruined for me.

- Lack of structure is counterproductive as people lose focus and the ability to care about it. The readings were sometimes so long that it was not enough time to read it. Especially the discussion about interaction between wild and farmed salmon was onerwhelming. When the work load is to big, it takes focus away from the scientific content, and there is not enough time to learn and understand.
- Heavy exam, the missing presentations from the external lecturers, change of schedule
- mye av pensum er ikke spesielt relevant for bacheloren, det var vanskelig å forstå hva man skulle gjøre og når. Mange beskjeder som kom fra forskjellige hold. Dårlig kommunikasjon
- . Antall poeng vi kan få på deltakelse i diskusjonene og tilbakemeldingene på innleveringene
- Alle de ulike kravene
- the coursework was too much. especially the exam was extreme. I don't feel that writing three big essays in three days is very educational. Nor is it a good representation of my writing skills or knowledge of the course, every person in academia always highlights the importance of not doing assignments in the last minute, because they will be bad, but that is what we were basically asked to do. also I think that the continuous assessment an writing tasks during the course took to much time considering that the course was only 10 credits.
- Jeg har aldri hatt et emne på UIB som har vert dårligere organisert eller gitt mindre informasjon om hva som foregår. Det jeg likte aller minst var at det ikke var mulig å få svar underveis i faget hvordan ting ville bli lagt vekt på. Vi fikk bare se at ting ga enn viss mengde poeng, men aldri informasjon om hvor stor prosentandel dette var av det totale faget, premissene må vere sene må vere sett på forhånd, så studentene vet hva de forholder seg til. Man kan ikke komme i ettertid (som det også ble gjort) og endre på det.

veldig uklart om hva som var obligatorisk og ikke

I tilegg ble alt for mye av undervisningen gjort av studentene selv i form av seminarer og foredrag, noe som ga et veldig lite faglig utbytte. Når det kommer flinke forskere fra blant annet HI, vil jeg mye heller høre på hva de har å si, enn å høre på andre studenter ha en presentasjon. Når det gjelder seminarene, var det for eksempel ingen faglig input fra noen andre, som gjorde at det ble mye synsing og svada generelt.

Det er den mest tullete eksamenen jeg noen gang har hatt, her måler dere ikke noe annet enn studentenes evne til å jobbe under ekstremt stress og det har ingenting med faglig kompetanse eller evne til å reflektere eller skrive å gjøre. The overall structure of the course was disheartening and took away from the learning process. Personally i fell like some

- things like word count and amount of pages written takes away from the focus, being the actual content. Maybe have focus on making a good essay/articlle, and then note the importance of laving down proper groundwork in the form of citations and references for the sake of argument, not for the sake of reaching a wordcount.
- Har du forslag til hvordan emnet kan forbedres?

besøk av Glove

- Litt mer aktiv informasjon. Ikke så stor eksamen
- likke sette karakterer på diskusjoner som ikke er obligatorisk. Karakter på diskusjoner som studenten selv skal lede.
- Lage plan ved starten av semesteret som viser alt som skal gjøres, inkludert små oppgaver.
- · Mer oversiktelige og mer struktur. Bedre kommunikasjon mellom studenter og forelesere.
- Focus on the three most important assignments: supermarket surprise, discussion essays and home exam. Ditch the rest

Reduce the amount of work on the home exam. Three scientific essays in three days might be doable for you, or Dorothy, but I was completely overwhelmed by that amount of work, as where most in my class, including the master students. I do not think you'll get quality work from pressuring people to write some 5500+ words on a well-cited, scientific basis in that amount of

One even told me that they might have accidentally plagiarized in a last-ditch effort to fill the quota, which seems kind of counterproductive.

- Structure on the discussion part is already decent, but have a clear divide of groups from the start

- Update the course objective - I don't feel that the description online quite match with the class we did have



Hvordan vil du totalt sett evaluere underviseren(e)?



Har du forslag til hvordan underviseren kan forbedre sin undervisning?

- Bedre organisering
- Struktur og bedre kommunikasjon med studentene
 I don't think employing people in the middle of parental leave is the best of ideas. Otherwise, I thought most instructors were good, especially Kevin and Dorothy. Presentations made available prior to the lecture.
- · Du (Audrey) var engasjert og flink til å snakke relevant, men du var dårlig til å gi ut god informasjon tidlig.
- Und (vourey) var eingasjent og nims in a snæke relevant, men ou var ganig til ag i ut god informasjon tidlig. Han mannen var fraværende, likke med, og det var mer en byrde å ha han i rommet enn noe forbedrende. Å holde diskusjon å se bort på at han er på tif, eller ikke følger med var rart og kjedelig. Også etter at man ikke følger med i timene dømmer essayene så strengt, som man har hatt gjort det er ikke fair. Lite tilbakemeldinger der. Om så store deler av faget er avhengig av det, og det ellers er så dårlig lagt opp kan man fint bruke en time på gjennomgang av essayskrivning.
- Undervisningen var veldig bra. Eneste forbedringen jeg vil se er når det kommer til å svare på mail. Vi var flere som ikke fikk svar på mailene vi sendte, selv om vi sendte fiere.
- på maxene vi senine, selv om vi senine here. faget i sin helhet har skapt mye frustrasjon for majoriteten av studentene, da ingen skjønte opplegget og poengsettingen mtp avslutende karakter. diskusjonene var like obligatoriske å møte på, men den teller alikevel på karakteren til slutt.. more specific information about ocurse and assignments
- Ved å undervise og ikke flytte all undervisningen over på studentaktivitet.

Språk



Samlet status

- · Decrease the amount of readings and give the students more than a couple a days to read the articles
- Communication between 205 and 208 to ensure that it is possible to attend as much as possible, so nothing collid
- Mer relevante problemstillinger (for en norsk student), bedre kommunikasjon. Få informasjon tidligere. Ha færre diskusjoner, og heller med relevante forelesninger. Det jeg lærte i dette faget var å snakke engelsk og å skrive essay (Ungdomsskole og vgs pensum altså! er sååå rart at det er det man skal lære på universitetet. dårlig!)
- I starten av semesteret var det for mange innleveringer, arbeidsmengden var for stor og det gikk utover andre fag. Arbeidsmengden var mer passelig senere i semesteret. Noen ganger var ikke instruksjonene gode nok, og det var uklart hva vi skulle gjøre for eksempel når det kom til "Supermarket Surprise". Foreleser fant derimot en god issning på dette i ettertid. Tilbakemeldingene på innleveringene var også ofte mangelfull. Vi mangiet gjørene poeng flere steder, men det var ikke klart hvorfor vi hadde fått trekk, og dermed visste vi likke hvordan vi kunne forbedre oss til neste gang. Arbeidsmengden på eksamen var også alt for stor. Å skrive mellom 5500 og 7000 ord på 3 dager, samt gjøre en god jobb og fåt til til å finne gode referanser, er å kreve alt for mye. Ja, man kunne gjørne velge temaer man har dekket i sine tidligere innleveringer, men jeg ville lære mest mulig i dette faget og valgte temaer jeg ikke enda hadde fått fordype meg I. Dermed tok det mye til å finne gode referanser, takke klart hvor mye trekk man får av dette. Flere ble ikke ferdig med antall ord og en grei struktur, men det glikk utover referansene. Det var ikke klart hvor mye trekk man får av dette. Flere ble ikke ferdig med sine eksammener, noe som er veldig forståelig med tanke på arbeidsmengden. Jeg syns at mengden ord enten burde kortes ned eller at tidsrammen burde økes, og at måten det fungrete på nå er en urettferdig vurderingsmetode.
- få ned antall karaktergivende situasjoner. 9-10 karakterer er for mye
- the course is quite interesting, but the workload definitely has to be reduced and the exam must be changed!
- Ha en skilkkeleg plan over faget som studentene får tilgang til med en gang, gi oversikt over hvor mye ting teller i faget, ha mindre studentaktivitet og flere skilkkelige forelsninger og gjør om på eksamenen.
- · restructure and refocus on the course material, which was interesting. The course also lacked structure
- Tilbakemeldinger på organisert praktisk undervisning?
- Alt for mye og rotete
- Likte diskusjonstimene. Lærte å diskutere og snakke engelsk med andre. Likte også at vi hadde noen framføringer, slik at jeg kunne bli mer komfortabel med det.
- Gode diskusjonsgrupper aktuelle utfordringer innenfor oppdrett
- I was very happy with my final group. I liked working with all three, and we had a nice rotation of roles and division of work among us. I felt lucky to have such a nice set of people to work with, since group work can be a bit of a hit and miss for me
- I really enjoyed working with exchange students, and I think it's a good idea to force people to work with others than their best friends.
- The group sessions were very useful and a good way to learn, but sometimes the readings were made available to short time before the sessions
- Nutrient enrichment could have been a bit more in focus, reducing the coverage of genetic introgression of escapees.
 For mange, noe som jeg tror ikke hjalp på motivasjonen. Hadde man helt fritt kunnet finne problemstillinger selv og, kunne man finne kulere, mer spennende og mer relevant problemstillinger. Greit nok at du kan mer enn oss, men fra et pedagogisk
- synspunkt er det greit å ta til seg det som studentene og vil, og hva de interesserer seg for. Jeg syns diskusjonstimene var veldig spennende og et bra opplegg. Derimot syns jeg at de teller for lite når det kommer til poeng, da de kun teller 20 poeng. Tror dette var grunnen til at flere ikke hadde lest materialet før diskusjonstimene, som gjorde at de ikke detok like mye. Ofte var vi de samme personene som diskuterte, og det ble litt kjedelig i lengden. Hadde diskusjonsdelen telt mer tror jeg flere hadde forberedt seg og detatt aktivt. Jeg savner også en tilbakemelding på
- diskusjonstimene siden vi ikke har fått vite poengsummen vår enda.

 the group discussions were quite interesting but in the end always led to the same point. I feel like they could have been done more efficiently
- · Var seminarene obligatoriske? Det vet jeg fortsatt ikke, så gi skikkelig informasjon. Ha færre seminar