

NEWCASTLE UNIVERSITY



SCHOOL OF CHEMISTRY



**CHEMISTRY WITH INDUSTRIAL
TRAINING**

PLACEMENT YEAR HANDBOOK

2009-2010 SESSION

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**SCHOOL OF CHEMISTRY
CHEMISTRY WITH INDUSTRIAL TRAINING,
CHEMISTRY WITH MEDICINAL CHEMISTRY WITH INDUSTRIAL TRAINING,
DEGREE PROGRAMME HANDBOOK
PLACEMENT YEAR**

SECTION 1

The Degree Programmes

The following Industrial Training degree programmes are offered:

BSc

- F102 Chemistry with Industrial Training
4 year BSc. Year in industry between stages 2 and 3
- F122 Chemistry with Medicinal Chemistry with Industrial Training
4 year BSc. Year in industry between stages 2 and 3

MChem

- F106 Chemistry with Industrial Training
4 year MChem. Stage 3 in industry.
- F124 Chemistry with Medicinal Chemistry with Industrial Training
4 year MChem. Stage 3 in industry

1.1 Aims of the Degree Programmes

- (i) to enthuse students in chemistry by educating them with a thorough understanding of organic, inorganic and physical chemistry; to demonstrate how chemical principles can be applied to processes and systems; to provide training in problem solving, communication skills, numeracy and information technology, and to equip students with skills that enable them to pursue careers in chemistry, chemistry-related disciplines or other professions.
- (ii) for MChem programmes, to educate students with a sound understanding of some advanced topics of chemistry and to introduce students to research at both experimental and theoretical levels. To equip students with skills to enable them to pursue a career in research.
- (iii) for medicinal chemistry programmes, to educate students with a thorough understanding of the essential principles and applications of medicinal and biological chemistry and to equip students with skills to enable them to pursue careers in medicinal-, pharmaceutical- and biochemical related disciplines.
- (iv) to provide the opportunity for students to apply their skills in an industrial environment.

1.2 Specific Objectives of the Degree Programmes

In order to achieve these aims, the objectives of all these degree programmes are:

- to provide a learning environment where all students can develop and progress;
- to equip students with a knowledge of the fundamental aspects of chemistry in accordance with the accrediting professional institution, The Royal Society of Chemistry (RSC);
- to use examples of chemistry at research level to illustrate and reinforce basic concepts;
- to provide experience and familiarity with a wide range of experimental techniques and their safe application;
- to provide opportunities for students to acquire knowledge in other subjects depending on ability and interest;
- to provide students with the cognitive skills associated with organising, interpreting analysing and evaluating chemical information, particularly in laboratory classes and research projects.
- to develop core transferable skills: communication skills are developed both through tutorials and laboratory reports and through a specific stage 2 .Group Assignment in Chemistry or Medicinal Chemistry. module which also emphasises teamwork. Problem solving is developed throughout the course and in specific stage 3 and Stage 4 .Problem Solving. modules. Problem solving is further developed, through a stage 4 project for MChem students.
- to develop personal skills: time management and self organisation skills are developed through the experience of independent learning. Laboratory work provides particular opportunities to develop and practise these skills. Specific coaching in presentation skills is associated with both the Group Assignment and the presentation of the stage 3 advanced practical.
- to provide work experience in a chemistry-related industry

Additional objectives of the particular degree programmes are:

Chemistry with Medicinal Chemistry

- to educate students with the principles of medicinal and biological chemistry.

MChem degree programmes

- to educate students with advanced chemical topics
- to introduce students to research in a specific area of chemistry

The Placement Year is an integral and compulsory component of these degree programme which aims to:

- provide students with the experience of seeking and securing a position within an appropriate placement organisation
- encourage self appraisal and the ability to present themselves effectively to potential placement hosts
- provide a period of practical experience which will benefit the student's academic study and longer term career
- facilitate personal development in a non-university setting.

1.3 Timing of Industrial Training Year

Students registered for the BSc degree programmes, F102 and F122, spend a year between stages 2 and 3 in an industrial placement.

Students registered for the MChem degree programmes, F106 and F124, spend stage 3 in an industrial placement.

1.4 Finding a Placement

Key requirements are a well-prepared curriculum vitae, identification of the type of work and geographical location desired of the placement, and applications to appropriate host organisations using their application procedures or by letter.

Before applying for placements, students must ensure that any relevant information which might have a bearing on their ability to undertake a placement is disclosed to the placement organiser; and that they have consulted with parents, guardians and families and any others who may need to know about the placement.

Assistance in the preparation of a CV is given in conjunction with the Careers Service to all students as part of the Stage 2 Group Assignment module.

The School helps to identify suitable placements by liaising with potential placement providers and students during the application process but it is the students' responsibility to meet application deadlines and attend interviews if requested to do so.

It is permissible for students to find their own placement, but in this case the placement coordinator must be consulted. In such cases, the School will contact the proposed placement provider to confirm that the placement will provide a suitable experience and will meet the necessary health and safety standards and also to provide the potential placement provider with sufficient information to enable them to judge whether they can offer a suitable placement (see Appendix).

Placements are subject to availability and selection following interview by the company concerned. Students who do not manage to find a placement will be transferred to the corresponding MChem or BSc degree at Newcastle.

1.5 Qualifying for the Industrial Training Year

BSc Programmes:

To qualify for this option students should normally have passed Chemistry Stage 2 modules.

MChem Programmes:

To qualify for this option students should meet the requirements of the other MChem programmes (see Progression within the MChem). Candidates who fail to achieve an average overall mark of 55.0 at Stage 2 will normally be transferred from the MChem to the BSc programme. Students transferred from MChem to BSc still undertake the placement, but without assessment. Candidates who fail modules in the first semester examinations at Stage 3, or who are deemed to have made insufficient progress in the industrial project by the end of the first semester at Stage 3, may also be transferred to the BSc Honours degree programme.

1.6 Induction for the Industrial Training Year

Information concerning the organisation of the placement programme, where to look for placement opportunities, and application procedures is given during induction week at Stage 2. Induction on preparing a CV is given in week 12 of Stage 2 in conjunction with the Careers Service as part of the Group Assignment module CHY2001. Prior to starting their year out, all students are expected to participate in a workshop to help prepare them for their Industrial Training Year. This workshop will be held after the Semester 2 examinations and before the end of term.

Placement providers are also expected to provide induction for students at the start of the placement. Confirmation that this induction has been adequate is obtained from students at the start of their placement year (see Form 2, later).

SECTION 2

Placement Information

2.1 Fees During the Industrial Training Year

During the year, students continue to be registered students of the university and continue to be regarded as university students by their local education authorities. Therefore, they continue to be liable for a contribution to university fees; this is reduced to £790 (to be confirmed). As a registered student, you benefit from a 50% reduction in the council tax element of your accommodation costs.

2.2 Academic Visits and Contact During the Industrial Training Year

The placement co-ordinator will maintain regular e-mail contact with placement students throughout the year in order to ensure that any potential problems/concerns are addressed. The industrial supervisor is also contacted, normally within the first six weeks of the placement, and asked to comment on how the placement is progressing and whether there are any concerns which need addressing (see Form 3, later).

Students are also encouraged to keep in touch with their tutors and other key teaching staff by e-mail or other means.

All Programmes

All placement students will receive a visit from a member of academic staff (e.g. the placement co-ordinator, your tutor, or other). In most cases this will take place in May.

The placement visitor will want to talk to you about your experience, look at the facilities and workplace, and talk to your supervisor to get an idea of how they feel you are performing.

MChem Programmes

The completion of the year-out assessment process takes place during the visit for students on the MChem programmes.

2.3 Assessment

The BSc placement year is not assessed.

For MChem programmes

The assessment of the placement year is based on your performance in the project and the distance learning modules which you take whilst out on placement. Details of these modules are given in the module descriptions below and in the Appendix.

2.4 Modular Structure of the MChem Placement Year

Your industrial supervisor assesses, in consultation with the academic placement visitor, your overall performance over the course of your placement.

In addition to this, the project assessment tasks are completed on the occasion of the placement visit and involve a presentation on your work over the year, report and a viva with your supervisor and the placement visitor.

The breakdown of the project assessment components is shown below:

Summary of Project Assessment

Project work	End of May	30%	Industrial supervisor*
Final presentation	End of May	15%	Industrial supervisor & placement visitor
Final report	End of May	30%	Industrial supervisor & placement visitor
Viva	End of May	25%	Industrial supervisor & placement visitor

* In consultation with the placement visitor/placement co-ordinator

Distance Learning

You take 40 credits of distance learning during your placement year (see Appendix for module outlines). These courses all span both Semesters 1 & 2 and are assessed by coursework (30%) and examination (70%) which takes place in the Semester 2 exam period. The distance learning material required for these courses is provided on-line, via Blackboard in the normal way (paper copies can be provided if you require this). This material is supported by a series of written exercises, including guided reading material, which are supplied at regular intervals across the year. You will receive your marked work back with comments.

All students take the following compulsory modules

Code	Credit	Descriptive title	Sem
	s		
CHY3005	80	Research Project in Industry	1&2
CHY3105	20	Advanced Organic Chemistry	1&2
CHY3305	20	Advanced Inorganic Chemistry	1&2

There is a guide to distance learning study skills at the end of this Handbook.

2.5 Roles and Responsibilities

When you are on placement you must remember that you are an employee of your placement provider and are therefore expected to meet all the obligations of a normal employee of that organisation such as attending placement provider's induction programme, time keeping, meeting all health and safety requirements, holiday arrangements, etc. You must comply with any reasonable instructions given to you by your supervisor or other manager at your place of work. In addition you are acting as an ambassador for Newcastle University and, in particular, for your degree programme. The way in which you behave during your placement can influence your placement provider's willingness to take subsequent placement students. Please make sure that you create as good an impression as possible with your employer.

2.5.1 Before starting your placement

You must attend a briefing meeting with the Placement Co-ordinator prior to going on placement and you will be required to submit a form giving details of your pre-placement contact address (in case we need to contact you urgently), the name and address of your placement provider and the dates of your placement (Form 1, later). You will also be required to confirm that you understand your commitments to the University and your employer during the placement year.

2.5.2 Contact with the School during your placement

The placement co-ordinator will be in regular e-mail contact with you during your year out and acts as your first point of contact with the University.

This will provide the opportunity to discuss your progress. Placement supervisors will be asked to complete an assessment form during Semester 1 to give their appraisal of your performance so far. A copy of this form, Form 3 is at the back of this handbook so that you know what your placement supervisor will be asked to fill in.

Most of you will have access to e-mail so you will be able to keep in contact with School staff in addition to the placement co-ordinator, if necessary. You should keep in contact with other members of your year group and we will distribute a list of e-mail addresses for all placement students. School e-mail addresses are shown on the next page. While you are on placement you remain a Newcastle University student and your NuSmart card will remain active whilst you are out on placement.

2.5.3 In case of difficulties

Very occasionally some problem may arise during your placement. In the first instance you should try to solve the problem yourself by initiating discussions with the most appropriate person (probably your supervisor). If you are unable to resolve the problem you should contact the placement co-ordinator, your personal tutor or your degree programme director. You should outline the problem, what you have already done to try to solve it and why that has not been successful. You will then be contacted by someone from the School who will, if necessary, make contact with your placement provider on your behalf. Please remember, though, that you are an employee of your placement provider and should not expect any special treatment. It is important that if real difficulties arise the School is told as soon as possible because it is always easier to sort out problems as they arise rather than months later.

2.5.4 Health and Safety

While on placement the University retains responsibility for your health and safety. Before you go on placement your placement provider will be asked to complete a Health and Safety

Checklist and return it to the Department. This will allow us to be sure that your employer has in place appropriate Health and Safety provision. Such provision is only effective if you take note of your Health and Safety induction at the company and any subsequent briefings. You should ensure that you:

- have received a copy of your placement provider's Health and Safety guidelines
- are aware of the action to be taken in case of an emergency
- have familiarised yourself with the layout of the building, the location of firefighting appliances and how they work, position of emergency exits, position of telephones and first aid arrangements
- know of any specific health and safety requirements if you are required to work off-site or out of normal working hours
- report any accidents or incidents in accordance with placement provider's requirements

While the University will take all reasonably practicable steps to ensure the success of the placement, you should be aware that it:

- cannot guarantee the safety of participants or eliminate all risks from working or studying in another location;
- cannot monitor or control the daily personal decisions, choices and activities of individuals on placements;
- cannot prevent you from engaging in illegal, dangerous, or unwise activities;
- cannot assume responsibility for the actions of persons not officially involved in the placement, for events outside the placement, or for situations which arise as a result of the failure of a student to disclose pertinent information prior to going on placements]

2.5.5 Personal liability and insurance responsibilities

For the majority of placements you will be covered by your employer's insurance. Alternatively, you will, if necessary, be covered by the University's indemnity insurance. Further details can be obtained from the Placement Co-ordinator who will provide the necessary forms which the employer will need to complete.

2.6 **Returning to Newcastle**

BSc and Stage 3 MChem students will be contacted at the appropriate time during your year out to sort out pre-registration/module selection for the following year. All of the returning students attend a placement feedback session held by the co-ordinator in induction week (See the Feedback Form, Appendix). You should also be prepared to speak to the Stage 2 class about your placement (not the technical side, but rather the experience from your perspective).

BSc students

Return and take the normal Stage 3 course.

MChem chemistry students

Return and take a Research Project (40 credits); Research Preparation (CHY4002, 10 credits); Problem Solving A (CHY3401, 10 credits); Problem Solving B (CHY3402, 10 credits); Advanced Physical Chemistry (CHY3201, 20 credits); plus three 10 credit modules from the Stage 4 options.

MChem medicinal chemistry students

Return and take a Research Project (40 credits); Research Preparation (CHY4002, 10 credits); Problem Solving A (CHY3401, 10 credits); Chemical Toxicology (CHY3102, 10 credits); Chemotherapy (CHY3103, 10 credits); Chemical Biology (CHY3007, 10 credits); Advanced Methods in Drug Discovery (CHY4103, 10 credits); plus two 10 credit modules from the Stage

4 options.

2.7 School Contact Details

Dr John Lloyd (*Head of School*)

Room 1.17 Bedson Building

e-mail: john.lloyd@ncl.ac.uk

Tel: 0191 222 8154

Dr Julian G. Knight (*Placement Co-ordinator*)

Room 3.14 Bedson Building

e-mail: J.G.Knight@ncl.ac.uk

Tel: 0191 222 7068

Prof. Richard A. Henderson (*Degree Programme Director*)

Room 1.06 Bedson Building

e-mail: R.A.Henderson@ncl.ac.uk

Tel: 0191 222 6636/6639

Dr Christine Bleasdale (*Director of Teaching and Learning*)

Room 3.13

e-mail: Christine.Bleasdale@ncl.ac.uk

Tel: 0191 222 7070

Mrs Isobel Lamb (*Head of School Secretary*)

Room 1.30 Bedson Building

e-mail: Isobel.Lamb@ncl.ac.uk

Tel: 0191 222 7102

School General Office

Mrs Margaret Douglas

Room 1.28 Bedson Building

Tel: 0191 222 7069

Fax: 0191 222 6929

Dr M Hall (Contact person for CHY3105 Advanced Organic Chemistry)

Room G.12, Bedson Building

e-mail: Michael.Hall@ncl.ac.uk

Tel: +44 (0) 191 222 3614

Prof A Houlton (Contact person for CHY3305 Advanced Inorganic Chemistry)

Room G.11, Bedson Building

e-mail: Andrew.Houlton@ncl.ac.uk

Tel: +44 (0) 191 222 8660

website: <http://www.ncl.ac.uk/chemistry/>

School Address:

School of Chemistry

Bedson Building

University of Newcastle

Newcastle upon Tyne

NE1 7RU

NEWCASTLE UNIVERSITY
School of Chemistry
PLACEMENT YEAR INFORMATION

Pre-placement contact address:

Name:.....

Address:.....

.....

.....

Telephone:.....

Available at above address until:.....

Degree Programme: MChem/BSc Chemistry/Medicinal Chemistry**Placement:**

Name of Institution or Company:.....

Address of Institution or Company:.....

.....

.....

Telephone:.....

Starting date in placement:

Projected completion date:.....

I have received and agree to read the Placement Year Handbook Yes/No

I understand my commitments to the University and my employer during the placement year in relation to:

Health and Safety Yes/No

Completion of the initial Placement Year Report (form 2);
coursework and project report (MChem) Yes/No

My behaviour as a representative of the University Yes/No

Signed: Name: Date:

NEWCASTLE UNIVERSITY

School of Chemistry

PLACEMENT YEAR (Initial Report)

The purpose of this report is to make sure that we have all of your details up to date during your placement year and to ensure that the initial requirements of the placement are satisfactory and to identify at the earliest opportunity any problems that you may have. Please complete the form and return it to Julian Knight as soon as possible. If any of your details change, particularly your accommodation address, please inform us immediately.

Your name:	
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A. Work related matters

1.

Placement organisation name	
Address	
Telephone	
Fax	
Email address [if available]	

2. Title or description of your job:

3. Have you been assigned a particular project? Yes/No

If Yes, please outline the type of work in which you will be involved (there is a possible confidentiality issue here: confirm your answer with your supervisor)

4. Have the aims and objectives of the placement been clearly outlined? Yes/No

5. Has your role in your workgroup been identified? Yes/No

6. Has your role in the organisation been identified? Yes/No

7. Have specific targets and deadlines been set for you? Yes/No
8. Do you see a link between your present work and your studies at University? Yes/No

Comment:

9. Do you see a link between this work and the kind of work you would like to be involved with in the future? Yes/No

Comment:

10. Has the host organisation identified a member of staff (supervisor) to whom you are responsible? Yes/No

If yes, please give details of your supervisor

Name	
Designation (job title)	
Telephone number	
Email address	

11. How much contact do you have with your supervisor? (choose one of the following or give details)

Daily Weekly Monthly
 Once at start of placement Not yet made contact

Comments:

12. Have you encountered any problems with your salary payments (if applicable)

Comments:

13. Will you be required to work shift work? Yes/No

14. Are transport arrangements satisfactory if you need to work late? Yes/No

B. Workplace induction

1. Please indicate which of the following have been dealt with during your induction to the company.

Introduced to key staff members and their roles explained	Yes/No/NA
Lunch, tea and coffee arrangements	Yes/No/NA
Holiday and sickness arrangements	Yes/No/NA
Place of work	Yes/No/NA
Dress code	Yes/No/NA
Work space	Yes/No/NA
How to answer the telephone, transfer calls and make calls both internally and externally	Yes/No/NA
Post arrangements	Yes/No/NA
Car parking	Yes/No/NA
Health and Safety Issues	
Have you attended a health and safety briefing?	Yes/No/NA
Emergency procedures	Yes/No/NA
Safety policy received or location known	Yes/No/NA
Location of First Aid box	Yes/No/NA
First Aid arrangements (including names of first aiders)	Yes/No/NA
Fire procedures and location of fire extinguishers	Yes/No/NA
Accident reporting and location of accident book	Yes/No/NA
COSHH regulations/requirements	Yes/No/NA
Display Screen Equipment regulations/procedures	Yes/No/NA
Manual handling procedures	Yes/No/NA
Protective clothing arrangements	Yes/No/NA
Instruction on equipment you will be using (list equipment)	Yes/No/NA
Other issues	

It is your responsibility to clarify with your employer any points listed in the table above concerning your workplace induction that are relevant to your placement but about which you have not received any information.

2. (a) Have you asked your supervisor whether or not you are covered by the company insurance while working on your placement? Yes/No

(b) Are you covered by your company's insurance? Yes/No
If the answer is no, please contact Julian Knight immediately.

C. *Personal matters*

1. Please provide your accommodation address:

Telephone:

2. Which address would you like us to use if we need to write to you during your placement year? Work/Accommodation

3. Do you have adequate resources to enable you to access the distance learning materials (internet access, laptop computer, etc.)? Yes/No

Comments:

4. Do you have or anticipate any specific problems with which you would like our help? Yes/No

Comments:

If there are any confidential matters which you would like to discuss with your tutor, please do not hesitate to contact him or her. If you prefer to speak with the placement co-ordinator or Degree Programme Director (DPD) then please do so. Contact information is given in Section 2.6 of the Handbook.

SUPERVISOR'S INITIAL REPORT ON THE PROGRESS OF INDUSTRIAL PLACEMENT STUDENTS

Name of Company:.....

Name of Industrial Supervisor:.....

Name of Student:Date:_____

Please could you give a brief overview of the student's activities

.....
.....
.....

Has the student's background knowledge been sufficient for the work undertaken? YES/NO

If not please specify the areas in which the student has been deficient

.....
.....

Has the student been punctual? YES/NO

Has the student been conscientious? YES/NO

Has the student displayed initiative? YES/NO

Has the student fitted into the working environment? YES/NO

Has the student done any literature searches, reports and/or presentations? YES/NO

For laboratory based placements only

Has the student's experimental technique been GOOD / AVERAGE / POOR

Overall, how would you rate the student's performance (e.g. compared to other Industrial Placement Students you have worked with)?

VERY GOOD / GOOD / AVERAGE / BELOW AVERAGE / POOR

Please add any comments that you would like to make concerning the student.

.....
.....
.....
.....

Distance learning study skills

Familiarise yourself with your module

- As soon as possible, familiarise yourself with information relating to the module in order to establish what is expected of you.
- Look at any information available relating to:
 - the module description
 - the module objectives
 - the module requirements
 - the module syllabus
 - assignments
 - the media and technology required
 - the module calendar or assignment schedule
 - contact information
- Make sure you have access to the necessary equipment to complete the module e.g.
 - a computer with adequate hard disk space
 - internet access for e-mail transmissions
- Make sure you have access to Blackboard.
- Ensure you find out about set reading material or required text books and try to acquire these as soon as possible.

Learn to manage your time effectively.

- Although you may not have to attend classes regularly, you will still have to set aside regular time for studying.
- Try to commit a certain number of hours per week to your module. Make sure you complete assignments on time and do not fall behind.
- Break tasks into manageable (and meaningful) chunks.
- Stay caught up with reading and assignments.
- Have a [strategy for taking tests](#). Monitor your time.
- **Preview** - survey the material to get the big picture before reading the material.
- **Question** - set your purpose; ask what you already know. Ask what's important to understand from this assignment.

- **Read** - read for meaning and [annotate text](#). If you don't understand, adjust your strategy i.e., re-read or read slower.
- **Recite** - summarize what you just read by saying it or writing it in your own words. Make a note of questions that occur to you as you read.
- **Review** - go over it regularly so it stays fresh.
- Stay up-to-date on assignments. Learn material and review as you go along.
- Break up study sessions by units or chapters.
- Prepare to answer different kinds of test [questions](#).
- Survey the test. Answer the easiest questions first, to control anxiety. Then strategize a plan and concentrate greatest effort on the questions that are worth the most points.
- Map responses to essay questions before writing.
- [Web sites](#) providing information on taking exams.

Learn to be self-motivated and self-disciplined

- Set regular goals and deadlines and stick to them.
- Set some interim deadlines instead of waiting to the last minute to start assignments.
- Set manageable and realistic goals.
- It is essential that you avoid procrastination

Find an appropriate environment for study

- Find a quiet place free from distractions that you can use specifically for studying.
- Create a work atmosphere e.g. by working at a desk.
- Try to avoid using your study place for relaxing or social activities such as chatting, writing letters etc.
- Keep your work place free from clutter.
- Insure that your study area has:
 - good lighting
 - ventilation
 - low noise level
 - a comfortable (but not too comfortable) chair

- a desk large enough to spread out your materials
- all the equipment you need
- Ensure that your study area does not have:
 - a distracting view
 - a telephone
 - loud music
 - a television
 - other people who want to chat

Organise your materials

- Start a good filing system - organise documents into either traditional folders or folders on your PC.
- Save everything you write as you never know when you may need to refer to it again.

Keep in touch with your lecturers

- Contact your lecturer regularly either by e-mail or telephone.
- Ensure you seek immediate guidance from your lecturer if you do not understand the module material or are experiencing any other difficulties.
- If you have an unusual situation that hinders your work and prevents you from meeting a deadline, let your lecturer know immediately.

Develop good communication skills

- Pay careful attention to any instructions and ensure that you understand what is required when submitting assignments.
- Ask questions and do not be afraid to speak up if anything is unclear.
- Communicate any technical problems quickly as losing your Internet connection or e-mail facility can interrupt your progress.

Evaluate your own progress regularly

- Re-read the module objectives on a regular basis to see how you are progressing with them.
- Make an honest assessment of your progress.
- Discuss your progress with your lecturer and seek feedback.
- Take any necessary action if your progress is not as it should be.

Set up a study group with fellow students.

Taken from:

<http://campusone.ulster.ac.uk/welcome/distanceskills.shtml>

<http://www.bucks.edu/~specpop/studyskills.htm>

ADVANCED ORGANIC CHEMISTRY (DISTANCE LEARNING)		CHY3105 20 credits [5 ECTS credits] Semesters 1 and 2
Module Leader:	Dr M Hall	
Lecturers:	Prof M North	
Pre-requisites:	CHY2101	
Co-requisites:	An MChem placement in a university in North America or France or Spain or Germany or an approved UK industrial company	
Post-requisites:	Stage 4 of one of F105, F106, F124	
Aims	To equip students with the necessary knowledge and understanding for them to study organic chemistry at Stage 4, or to complete their degree programme; to further enhance student's knowledge of the chemistry of aldehydes, ketones, esters, amides and related species; to allow students to design syntheses of compounds containing C=O groups; to illustrate the rich and diverse chemistry of the carbonyl group and to show how this can be logically predicted; to introduce the concept of retrosynthetic analysis; to show how the chemistry of the carbonyl unit can be used in total syntheses. To show the importance of carbonyl reactions in enzyme chemistry. The highlight the use of organo-element compounds in the synthesis and reactions of carbonyl compounds.	
Assessment	Coursework (30%) set over the two semesters. Exam (70%) at the end of Semester 2.	

Module Summary

The reactions of compounds containing a C=O unit will be used to highlight and illustrate important ideas in organic chemistry. Both synthetic strategy and reaction mechanisms will be discussed and the use of organoelement based reagents to modify and control the chemistry of the C=O unit will be discussed.

Outline of syllabus

Synthesis of aldehydes, ketones, and carboxylic acid derivatives including oxidation and reduction methods (e.g. Swern oxidation and DIBALH as a reducing agent).

Nucleophilic additions to the C=O unit, including reactions which do not form alcohols (e.g. Wittig reaction and variants, epoxide synthesis).

Enolate chemistry of carbonyl compounds including aldol and Claisen condensations, intramolecular variations and tandem processes. Effect of metal ion and enolate geometry on stereochemistry of reactions.

Control of 1,2- versus 1,4-addition to alpha,beta-unsaturated carbonyl compounds.

The chemistry of the C=N unit compared to that of the C=O group.

Illustrative examples of total synthesis and biosynthesis to highlight the above and introduce important concepts in retrosynthetic analysis.

Intended Learning Outcomes**Intended knowledge outcomes:**

- Understand the methods available for the synthesis of compounds containing a C=O bond, including reaction mechanisms and an appreciation of the scope and limitations of each method.
- Understand the concept of nucleophilic addition to a carbonyl bond and the factors that determine the subsequent chemistry following nucleophilic addition. Students should understand the relevant reaction mechanisms.
- Understand the ways in which enolates can be prepared including control of regio- and stereochemistry.
- Understand the ways in which enolates react with electrophiles including reaction mechanisms.
- Understand the factors that determine the regiochemistry of reactions involving alpha,beta-unsaturated carbonyl compounds.
- Understand how and why the chemistry of the C=N group is both similar and different to that of the C=O group.
- Be familiar with the concept of retrosynthetic analysis and be able to apply this technique to compounds containing or derived from carbonyl groups.
- Appreciate the importance of carbonyl based chemistry in biological systems

Intended skills outcomes:

Subject specific or professional skills, able to:

- Subject specific or professional skills, able to:
- interpret experimental evidence and use this to elucidate reaction mechanisms.
- predict chemistry and reactivity based on key chemical concepts.
- Cognitive or intellectual skills, able to:
- draw curly arrow mechanisms for a wide range of reactions
- solve problems of synthesis and mechanism
- assess the overall efficiency of a given synthetic route.

Key skills, able to:

- undertake self directed study

Rationale and relationship to learning outcomes:

Lectures are delivered electronically and these bring together advanced concepts in organic chemistry, encompassing synthetic and mechanistic principles. Student learning is supported by the provision of worksheets which are returned with formative feedback.

Reading references					
Title of book (plus publisher and year if known) or Journal (plus article) or web page reference:	Author(s)	ISBN	Essential (please)	Background (please)	Recommended (please)
Organic Chemistry Oxford University Press 2000	J Clayden N Greeves S Warren PWothers				

ADVANCED INORGANIC CHEMISTRY (DISTANCE LEARNING)		CHY3305 20 credits [5 ECTS credits] Semesters 1 and 2
Module Leader:	Prof. A. Houlton	
Lecturers	Dr S Doherty Dr KJ Izod	
Pre-requisites:	CHY2301	
Co-requisites:	An MChem placement in a university in North America or France or Spain or Germany or an approved UK industrial company	
Post-requisites:	Stage 4 of one of F105, F106, F124	
Aims:	To introduce the fundamental principles and reactions of organometallic chemistry; to introduce concepts of homogeneous catalysis; to demonstrate the diverse chemistry of the s- and p-elements; to discuss inorganic aspects of biological systems; to introduce aspects of contemporary inorganic chemistry research.	
Assessment	Coursework (3 x 10%) set over the two semesters. Exam (70%) at the end of Semester 2.	
Module Summary: This module builds on previous modules in inorganic chemistry and aims to enable students to understand selected areas of this discipline at an advanced level including contemporary main group chemistry, organometallic chemistry and bioinorganic chemistry. In addition students will learn material covering selected areas of contemporary inorganic chemistry research.		

Outline of syllabus:

Organometallic chemistry
Comparative main group chemistry
Bioinorganic chemistry
Contemporary inorganic chemistry research

Intended Learning Outcomes**Intended knowledge outcomes:**

- understand organometallic synthesis and reaction mechanism
- know about homogenous catalysis using organometallic compounds
- know about the organometallics of groups 1, 2 and 13
- know about the low oxidation state and multiply-bonded compounds of the p-block elements
- understand the chemistry of boranes and related cluster compounds
- understand of basic principles of bioinorganic chemistry
- know about the biological function of certain s-block and transition metal ions
- understand the interactions between metal ions and DNA
- know about the current frontiers of inorganic chemistry research

Intended skills outcomes:

Subject specific or professional skills, able to:

- develop synthetic routes to organometallic compounds

Cognitive or intellectual skills, able to:

- visualize three-dimensional inorganic molecules
- solve problems concerning inorganic synthesis and mechanism

Key skills, able to:

- plan and organise studies
- undertake self directed study

Rationale and relationship to learning outcomes:

Lectures are delivered electronically and are used to impart knowledge. Student learning is supported by the provision of worksheets which are returned with formative feedback

Reading references					
Title of book (plus publisher and year if known) or Journal (plus article) or web page reference:	Author(s)	ISBN	Essential (please)	Background (please)	Recommended (please)
Chemistry of the Elements Pergamon Press 1998 2 nd edition	NN Greenwood A Earnshaw				
Bio-inorganic Chemistry: Inorganic Elements in the Chemistry of Life Wiley 1994	W Kaim B Schwerderski				
Principles of Bioinorganic Chemistry University Science Books 1994	SJ Lippard JM Berg				
Advanced Inorganic Chemistry John Wiley 1999 6 th edition	FA Cotton C Murillo G Wilkinson M Bochmann and R Grimes				
Main Group Chemistry Wiley 2000 2 nd edition	AG Massey				

NEWCASTLE UNIVERSITY

School of Chemistry

PLACEMENT YEAR (Student Feedback Report)

The purpose of this form is to provide you with an opportunity to comment on your placement experience. Your comments are considered as part of our procedure for evaluating placements and will help to improve the experience of future placement students and are used to inform the School's annual monitoring and review process.

Placement organisation name	
Location of placement	
Nature of your work on placement	

1. how do you rate the adequacy of the information and guidance about the placement, provided prior to leaving the University? Good/Satisfactory/Poor
comments:

2. how do you rate the quality of learning opportunities and experiences during your placement? Good/Satisfactory/Poor
comments:

3. how adequate were the measures in place to guard your health, safety and welfare on placement? Good/Satisfactory/Poor
comments:

4. how do you rate the level of supervision and support given to you by your placement provider? Good/Satisfactory/Poor
comments:

5. how do you rate the level of support given to you by the University whilst on placement? Good/Satisfactory/Poor
comments:

6. What were the most worthwhile aspects of your placement experience?

7. Do you have any suggestions for changes to the placement or placement organisation which would improve the experience of students?

Any other comments:

Information for Potential Placement Providers

We have two flavours of Industrial Training, depending on whether the students are registered for **BSc** or **MChem**.

MChem students have a higher marks hurdle which they need to have reached at the end of their second year and thus may be academically a little stronger than the BSc.

All students follow our standard Chemistry or Chemistry with Medicinal Chemistry course in their first two years, and these are very much focused on the basic principles of the subject.

The main courses which students will have done during their two years at Newcastle prior to going out on placement are: Introductory Chemistry, Organic Chemistry, Inorganic Chemistry, Physical Chemistry, and Structural Chemistry, all of which have associated practical courses. In addition to these, students take various options including, commonly, Maths or Physics, various biological subjects, Introductory Medicinal Chemistry.

For BSc students, the year in industry is very much an opportunity to experience the work environment and we allow them to undertake most types of work as long as there is some scientific element. *The BSc year out is not assessed*, so the students do not need to produce any coursework or reports for us.

For MChem students, the year in industry *is an assessed part of the degree* and so they have to be able to write-up their work into a **project report** and also to deliver a **presentation** on their work. The industrial supervisor is involved in this assessment. Due to issues of commercial sensitivity, we normally assess the report and presentation on-site at the placement provider rather than in Newcastle and this has not presented problems so far.

In addition to the assessment of their placement work, MChem students are also required to take some courses by distance learning. The work that this involves is spread out over the year and is expected to be done out of office hours so as not to interfere with the placement work. It is helpful if students have internet access to coursework materials from the University's virtual learning environment (Blackboard).

The progress of students is monitored by regular e-mail contact from the placement co-ordinator and the industrial supervisor is required to provide feedback in the early stages of the placement. All students receive a visit from a member of academic staff who will also talk to the industrial supervisor and complete any assessment tasks necessary.

Potential placement providers contact the placement co-ordinator with a summary of the type of work, information about the placement provider, the application process (on-line or CV plus covering letter etc.) and the application deadline. This information is distributed to the students and they choose whether to apply. In the case of placement providers with whom we have not previously had contact, completion of a placement evaluation form is necessary in order for us to ascertain that the placement is suitable.

Evaluation Form for Proposed Placements

The purpose of this form is to enable us to confirm that the proposed placement is suitable as part of our degree programmes at Newcastle University and meets our minimum requirements. It is not essential that all of the answers are positive, some will determine whether the placement is suitable for MChem or BSc students.

A. Placement details

Placement organisation:

Address:

Telephone:

Fax:

Email address [if available]:

Title or description of the job:

Outline of the type of work in which the student will be involved.

Outline the main responsibilities of the student.

Will a member of staff (supervisor) be identified to whom the student is responsible?

Yes/No

How much contact will the student have with the supervisor?

(choose one of the following or give details)

Daily

Weekly

Monthly

Will the student be required to work shift work?

Yes/No

Will the student be covered by the company insurance while working on placement?

Yes/No

B. Workplace induction

Please indicate which of the following will be dealt with during induction of the student to the company.

Introduction to key staff members and explanation of their roles	Yes/No/NA
Holiday and sickness arrangements	Yes/No/NA
Place of work	Yes/No/NA
Work space	Yes/No/NA
Health and Safety Issues	
A health and safety briefing?	Yes/No/NA
Emergency procedures	Yes/No/NA
Fire procedures and location of fire extinguishers	Yes/No/NA
Accident reporting and location of accident book	Yes/No/NA
COSHH regulations/requirements	Yes/No/NA
Manual handling procedures	Yes/No/NA
Instruction on equipment to be used	Yes/No/NA

C. Integration with the degree programme

Will a member of university academic staff be allowed to visit the student at their place of work? Yes/No

Will the industrial supervisor provide feedback to the University on the progress of the student? Yes/No

Does the placement involve an element of project work? This may be method development, process optimisation, or other investigation. Yes/No
Please give brief details:

Will the student be required to complete written reports or to give presentations as part of the placement work? Yes/No
Please give brief details:

Will the student have access to resources to enable them to produce a written report and presentation towards the end of the placement? Yes/No

Will the student have internet access at work to enable them to contact University staff by e-mail or to access learning materials? Yes/No