

MODULE ASSESSMENT APPROVAL FORM (INCLUDING COLLABORATIVE PROVISION)

This form is used to ensure that assessment specifications have been through an internal review process prior to external examination/approval and release to students. It should include details for each assessment for a particular module. The assessment tasks, criteria and marking scheme should accompany this form. **NOTE: It is important that the Moderator and External Examiner see all the assessments tasks (including examination papers) for a module at the same time, to enable them to ensure that the proposed assessment tasks fulfil the learning outcomes.**

UWTSD PROVISION: please submit the completed document to the appropriate Programme Manager.

COLLABORATIVE PROVISION: please submit the completed document to the Partnership Team Leader. This must be in accord with specific arrangements for sharing electronic documents (e.g. via SharePoint or similar).

The assessment tasks, criteria and marking scheme **FOR EACH ASSESSMENT COMPONENT** within the module should accompany this form. **ONE APPROVAL FORM IS REQUIRED PER MODULE.**

PARTNER (and taught location if relevant):	COLEGI SIR GAW		
EXTERNAL EXAMINER NAME:	STEPHAN SIGURNSAK		
MODULE COORDINATOR:	CHRIS DAVIES		
MODULE TITLE:	MECHANICAL ENGINEERING		
MODULE CODE:	SGEE4017	MODULE LEVEL:	4
TYPE OF ASSESSMENT(S):	☒ Coursework	☐ Examination	☐ Practical
LANGUAGE OF ASSESSMENT(S):	ENGLISH	TRANSLATION REQUIRED	☐ Yes ☒ No
FOR EXAMINATIONS SPECIFY BELOW ANY ADDITIONAL MATERIAL(S) TO BE USED IN THE EXAMINATION			

INTERNAL MODERATOR PLEASE TICK TO INDICATE THAT THE ASSESSMENTS INCLUDES:		Please ✓		Comments
		YES	NO	
1	Tasks that are specified clearly, accurately and comprehensibly, with appropriate use of language and neat presentation	☒	☐	
2	Tasks which enable the module learning outcomes to be demonstrated (as per the module syllabus)	☒	☐	
3	Tasks which conform to the assessment described in the module syllabus	☒	☐	
4	Tasks which are written at the appropriate level of the Framework for Higher Education Qualifications (see https://www.qaa.ac.uk/the-quality-code/qualifications-frameworks)	☒	☐	
5	Clear criteria for assessment and guidance about how marking/grading will be applied	☒	☐	
6	Guidance about expected evidence for submission, e.g. essay or report, word count, bibliography and references	☒	☐	

7	Reference to good academic conduct, for example referencing, plagiarism and Turnitin	☒	☐	
8	Actions to complete None			

SIGNATURE OF APPROVAL:	SIGNATURE	DATE
INTERNAL MODERATOR: I confirm that this version of the assessment specification is ready to be sent to the External Examiner/Partnership Team Leader		25.09.24

ONLY TO BE COMPLETED IF THE ASSESSMENT IS LINKED TO A COLLABORATIVE PARTNER

PARTNERSHIP TEAM LEADER PLEASE TICK TO INDICATE THAT THE ASSESSMENTS INCLUDES:		Please ✓		Comments
		YES	NO	
1	Tasks that are specified clearly, accurately and comprehensibly, with appropriate use of language and neat presentation	☐	☐	
2	Tasks which enable the module learning outcomes to be demonstrated (as per the module syllabus)	☐	☐	
3	Tasks which conform to the assessment described in the module syllabus	☐	☐	
4	Tasks which are written at the appropriate level of the Framework for Higher Education Qualifications (see https://www.qaa.ac.uk/the-quality-code/qualifications-frameworks)	☐	☐	
5	Clear criteria for assessment and guidance about how marking/grading will be applied	☐	☐	
6	Guidance about expected evidence for submission, e.g. essay or report, word count, bibliography and references	☐	☐	
7	Reference to good academic conduct, for example referencing, plagiarism and Turnitin	☐	☐	
8	Actions to complete 			

SIGNATURE OF APPROVAL:	SIGNATURE	DATE
PTL: I confirm that this version of the assessment specification is ready to be sent to the External Examiner		

For completion by the External Examiner:

This assessment specification has been subject to internal scrutiny and approval processes. As External Examiner, please consider and comment on its suitability. The assessment tasks, marking criteria and marking scheme accompany this form.

	EE Approval		EXTERNAL EXAMINER COMMENTS
	YES	NO	
FIRST DRAFT	☐	☐	
			Signature and date:

FINAL DRAFT	☐	☐	<i>this box will expand as you type</i>
			Signature and date:

THIS DOCUMENT IS ALSO AVAILABLE IN WELSH

LEVEL 4 ASSESSMENT SPECIFICATION

Student name:		Student ID number:	
Programme:	HNC Electrical Engineering		
Module:	Mechanical Engineering.		
Module code:	SGEE4017	Contribution to Overall Module Assessment (%):	50%
Lecturer:	Dr Chris Davies	Internal Verifier:	John Williams
Assignment Title:	Investigation into Elastic Constants.	Word count (or equivalent):	2000
Submission deadline:		Return date of provisional marks & written feedback:	
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark: Work which is submitted up to 1 week late will be capped at 40% for the first attempt and will be awarded a mark of 0% for re-assessment. Late submission penalties may be lifted only if there is an approved extenuating circumstances claim. Work submitted more than 1 week late will be considered as a non-submission and will not be marked. The work may be considered as a submission for reassessment if offered by an Examining Board or if there is an approved extenuating circumstances claim.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Module Learning Outcomes (from module syllabus)
Demonstrate an understanding of the fundamental concepts in static and dynamic systems and comprehend their appropriate use. Demonstrate the ability to solve problems in simple static and dynamic systems through the application of suitable experimental and analytical techniques.

TASK DESCRIPTION

Use of Generative AI in Assessment
(Lecturer to indicate Yes or Not against each element)

RESEARCH	For this assessment, you can use Generative AI to support you in research, including searching for bibliography, using tools to summarise, compare and interrogate materials.	Yes ☐ No ☐
STRUCTURE	For this assessment, you can use Generative AI to support you in structuring your submission, including creating a draft argument structure, identifying parts and headings, etc.	Yes ☐ No ☐
PROOFREADING	For this assessment, you can use Generative AI to check your own text/creation for grammatical and syntactical mistakes, including rephrasing of your own work within specific standards.	Yes ☐ No ☐
WRITING	For this assessment, you can use Generative AI to create text for submission.	Yes ☐ No ☐
CREATIVE	For this assessment, you can use Generative AI to create creative materials, such as images.	Yes ☐ No ☐
PROGRAMMING	For this assessment, you can use Generative AI to create and check code.	Yes ☐ No ☐
NONE	For this assessment, you are not allowed to use any type of Generative AI support. This includes research support, structure support, writing/proofreading support and creative support.	Yes ☐ No ☒

Assignment outline.

This is a practical assignment using the mechanical testing equipment within the mechanics lab. The tests are designed to enable students to investigate the elasticity of materials when subjected to differing loading conditions. Your report should be consistent with the activities and findings and include all relevant information. It is suggested that you follow the following layout for the completion of your report:

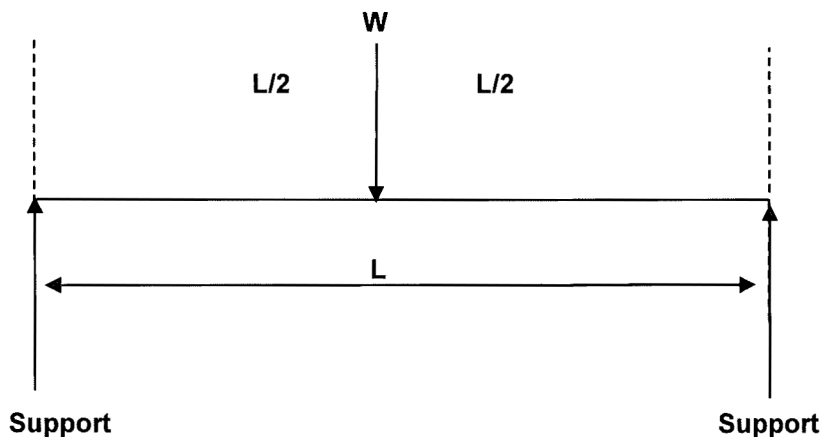
- Summary - identification of objectives, key theory and results, conclusions and recommendations.
- Introduction - what the assignment is about.
- Objective – of the tests undertaken.
- Background – relevant theory for both tests.
- Equipment – diagrams and listing.
- Method – the steps carried out.
- Results – numerical data obtained from the test.
- Conversion – of results into graphs etc.
- Discussion – identification and explanation of key areas of theory and results.
- Conclusion – comparisons of results to theory etc.

Test 1 – To investigate the effects of loading on a beam.

Method

1. Load the beam progressively at mid span.
2. At each stage, record the deflection at the midpoint.
3. Plot load v deflection and calculate Young's Modulus for the material under test.

Theory



The maximum deflection on a simply supported beam with a load at its centre is given by:

$$\text{Deflection} = \frac{WL^3}{48EI}$$

Where W = the point load (N)
 L = Distance between supports (m)
 I = second moment of area ($bd^3/12$) (m^4)
 E = Young's modulus (N/m^2)

To find the second moment of area of the bar $I = bd^3/12$ (m^4)
(Where b = breadth and d = depth of bar).

Theory Cont.

From the tabulated values of load and deflection create the following list of values.

Load (kg)	Weight (N)	Deflection (mm)
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Hence plot graph of load (W) against deflection and obtain the gradient (W/mm deflection).

Hence from

$$\text{Deflection} = WL^3 / 48 EI$$

Now calculate the value of E from.

$$E = L^3 / 48I \times \text{slope of graph}$$

Test 2 – To investigate the effects of torsion on a cylindrical rod.

Method

A torsion testing rig is suitable for testing rods within the elastic limit. The load is applied by means of a worm and wheel drive and the torque is measured by a torque arm and spring balance. The angle of twist is measured with circular protractors.

1. Using the torsion rig, record values of angle of twist produced against applied torque.

Torque applied (T) in N.M.								
Angle of twist (θ) in degrees								

Theory

$$T/J = \tau/r = G\theta/L \quad \text{Therefore } G = (L/J) \times (T/\theta)$$

Where G = the modulus of rigidity of the material

T = torque (Nm)

θ = twist angle (rads)

L = length (m)

J = polar second moment of area (m⁴)

Calculations

Tabulate the results as follows

Applied torque (Nm)	Twist angle (degrees)	Twist angle (rads)
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From the results plot a graph of T v θ (T- vertically) and obtain the gradient of the line. Now calculate the value of G.

Discussion

In relation to both tests address the following discussion points.

Test 1

- a. Determine the maximum stress and its location on the beam. In relation to the beam used comment on the result and include an analysis of factors which could be considered to lower the stress if required.
- b. What is the significance of the term “flexural rigidity” when considering the deflection of beams. How does it relate to the properties of the beam and its size?
- c. In practice how might a designer reduce the deflection experienced by a beam when subject to given loading conditions?

Test 2

- a. Comment on the significance of the torsion test and how it is of practical value to the engineer.

You may also wish consider other elastic constants and the relationships to E and G.

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

NOTE: The guidance offered below is linked to the five generic assessment criteria overleaf.

1. Engagement with Literature Skills

Your work must be informed and supported by scholarly material that is *relevant* to and *focused* on the task(s) set. You should provide evidence that you have accessed an appropriate *range* of sources, which may be academic, governmental and industrial; these sources may include academic journal articles, textbooks, current news articles, organisational documents, and websites. You should consider the *credibility* of your sources; academic journals are normally highly credible sources while websites require careful consideration/selection and should be used sparingly. Any sources you use should be current and up-to-date, mostly published within the last five years or so, though seminal/important works in the field may be older. You must provide *evidence* of your research/own reading throughout your work, using a suitable referencing system, including in-text citations in the main body of your work and a reference list at the end of your work.

Guidance specific to this assessment:

2. Knowledge and Understanding Skills

At level 4, you should be able to demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study. *Knowledge* relates to the facts, information and skills you have acquired through your learning. You demonstrate your *understanding* by interpreting the meaning of the facts and information (knowledge). This means that you need to select and include in your work the concepts, techniques, models, theories, etc. appropriate to the task(s) set. You should be able to explain the theories, concepts, etc. to show your understanding. Your mark/grade will also depend upon the *extent* to which you demonstrate your knowledge and understanding.

Guidance specific to this assessment:

3. Cognitive and Intellectual Skills

You should be able to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study. You should be able to evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work. Your work must contain evidence of logical, analytical thinking. For example, to examine and break information down into parts, make inferences, compile, compare and contrast information. This means not just describing what! But also justifying: Why? How? When? Who? Where? At what cost? You should provide justification for your arguments and judgements using evidence that you have reflected upon the ideas of others within the subject area and that you are able to make sound judgements and arguments using data and concepts. Where relevant, alternative solutions and recommendations may be proposed.

Guidance specific to this assessment:

4. Practical Skills

At level 4, you should be able to apply the basic underlying concepts and principles to evaluate and interpret these within the context of your area of study. You should be able to demonstrate how the subject-related concepts and ideas relate to real world situations and/or a particular context. How do they work in practice? You will deploy models, methods, techniques, and/or theories, in that context, to assess current situations, perhaps to formulate plans or solutions to solve problems, or to create artefacts. This is likely to involve, for instance, the use of real world artefacts, examples and cases, the application of a model within an organisation and/or benchmarking one theory or organisation against others based on stated criteria.

Guidance specific to this assessment:

5. Transferable Skills for Life and Professional Practice

Your work must provide evidence of the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility. This includes demonstrating: that you can communicate the results of your study/work accurately and reliably, and with structured and coherent arguments; that you can initiate and complete tasks and procedures, whether individually and/or collaboratively; fluency of expression; clarity and effectiveness in presentation and organisation. Work should be coherent and well-structured in presentation and organisation.

Guidance specific to this assessment:

STUDENT FEEDBACK FORM

This section details the *extent* to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Marks available	Marks awarded
1. Engagement with Literature Skills		
	20	
2. Knowledge and Understanding Skills		
	30	
3. Cognitive and Intellectual Skills		
	20	
4. Practical Application Skills		
	15	
5. Transferable Skills for Life and Professional Practice		
	15	

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		%
	Up to 1 week late (40% Max)		
	Over 1 week late (0%)		

GENERIC ASSESSMENT CRITERIA

Level 4

In accordance with the Framework for Higher Education Qualifications, at the end of Level 4 students will be expected to have demonstrated knowledge of the basic underlying concepts and principles of a subject, and an ability to evaluate and interpret these within the context of that area of study. They should be able to present, evaluate and interpret qualitative and quantitative data in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of their subject(s) of study. They will have learned how to evaluate different approaches to solving problems, and will be able to communicate the results of their study/work accurately and reliably, and with structured and coherent arguments. They will be able to undertake further training and develop new skills within a structured and managed environment and will have the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility.

Level 4	Category	FAIL 0-29%	MARGINAL FAIL 30-39%	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
	Engagement with literature (including reading, referencing, academic conventions and academic honesty)	Little or no evidence of reading and/or reliance on inappropriate sources. Views and findings mostly unsupported and non-authoritative. Referencing conventions used incoherently or largely absent.	Poor engagement with essential reading. No evidence of wider reading. Reliance on inappropriate sources, and/or indiscriminate use of sources. Heavily reliant on information gained through class contact. Inconsistent and weak use of referencing.	Engagement with a limited range of mostly relevant and credible sources but with some reliance on information gained through class contact. Some omissions and minor errors. Referencing conventions evident though not always applied accurately or consistently.	Engagement with an appropriate range of literature, including sources retrieved independently. Some over-reliance on texts rather than other sources. Referencing may show minor inaccuracies or inconsistencies.	Engagement with a wide range of literature, including sources retrieved independently. Selection of relevant and credible sources. Generally sound referencing, with no/very few inaccuracies or inconsistencies.	Engagement with an extensive range of relevant and credible literature. Consistently accurate application of referencing.	Exceptional engagement with an extensive range of relevant and credible literature. High-level referencing skills consistently applied.
	Knowledge and understanding (Knowledge of the basic underlying concepts and	Major gaps in knowledge and understanding of the basic underlying concepts and	Gaps in knowledge of the basic underlying concepts and principles, with flawed or	Limited knowledge and understanding of the basic underlying concepts and	Knowledge of the basic underlying concepts and principles is accurate with a	Competent knowledge of the basic underlying concepts and principles. Exhibits very	Excellent knowledge and understanding of the basic underlying concepts and	Exceptional, detailed knowledge and understanding of the basic underlying

Level 4	FAIL	MARGINAL FAIL	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
principles of a subject.)	principles of the subject matter. Inclusion of irrelevant material. Substantial inaccuracies.	superficial understanding. Some significant inaccuracies and/or irrelevant material.	principles within the subject area. Some elements may be missing.	good understanding of the field of study but lacks depth and/or breadth.	good understanding.	principles of the subject.	concepts and principles
Cognitive and intellectual skills (Evaluate underlying concepts and principles of a subject and interpret qualitative and quantitative data in order to develop lines of argument and make sound judgements.)	Wholly or almost wholly descriptive work. Little or no evaluation of the underlying concepts and principles. Failure to develop arguments, leading to illogical or invalid judgements. Minimal or no use of evidence to back up views.	Largely descriptive work, with superficial evaluation of the underlying concepts and principles. Weak interpretation of data, flawed development of arguments and judgements. Information accepted uncritically, uses generalised statements made with scant evidence and unsubstantiated opinions. Ideas sometimes illogical and contradictory.	Limited attempt at evaluation of the underlying concepts and principles, tending towards description. Can interpret qualitative and quantitative data but with some errors. Some evidence to support emerging arguments and judgements but these may be underdeveloped or with a little inconsistency / mis-interpretation.	Good evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data, with minor errors. An emerging ability to use evidence to support the argument. Mostly valid arguments and logical judgements.	Sound evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data accurately. Ability to devise arguments using evidence to make mostly appropriate and valid judgements.	Excellent evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data accurately and with some insight. Excellent ability to devise arguments using evidence and make appropriate and valid judgements.	Exceptional evaluation of the underlying concepts and principles based on evidence. Outstanding interpretation of qualitative and quantitative data. Exceptional ability to devise arguments using evidence and make wholly appropriate and valid judgements.
Practical skills (Different approaches to solving problems in particular contexts.)	Limited or no use of taught, basic methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of taught, basic methods, materials, tools and/or techniques but without consideration and	An adequate awareness and mostly appropriate application of basic methods, tools and/or techniques.	A good and appropriate application of basic methods, materials, tools and/or techniques. Clear appreciation of	A very good application of a range of basic methods, materials, tools and/or techniques. Very good consideration of the context of	An advanced application of a range of taught, basic methods, materials, tools and/or techniques. The context of the application is	Exceptional levels of application and deployment skills in particular practical contexts. Outstanding identification of

Level 4	FAIL	MARGINAL FAIL	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
	Very weak evidence of different approaches to problem-solving in particular contexts.	competence. Flawed appreciation of the context of the application. Weak evidence of different approaches to problem-solving in particular contexts.	Basic appreciation of the context of the application. Can identify problems in particular contexts and propose basic alternative approaches or solutions though there may be errors.	the context of the application. Good evidence of different approaches to problem-solving in particular contexts and proposes mostly appropriate solutions.	the application. Very good evidence of different approaches to problem-solving in particular contexts and proposes appropriate solutions.	well considered, and insightful. Excellent evidence of different approaches to problem-solving in particular contexts and proposes appropriate solutions.	problems in particular contexts and formulation of wholly appropriate, thoughtful solutions / different approaches.
Transferable skills for life and professional practice (Communicate the results of their study/work accurately and reliably, and with structured and coherent arguments; the qualities needed for employment requiring the exercise of some personal responsibility within a structured and managed environment.)	Work is poorly structured, disorganised, inaccurate and/or confusingly expressed. Very weak use of language and/or very inappropriate style. Failure to work effectively individual or as part of a group. Little or no evidence of the skills for employment requiring the exercise of some personal responsibility.	Work is poorly presented in a disjointed manner. It is loosely, and at times incoherently, structured, with information and ideas often poorly expressed. Weak use of language and/or inappropriate style. Flawed approach to individual or group work, meeting only partial obligations to others. Limited evidence of the skills for employment requiring the	Mostly ordered presentation and structure in which relevant ideas / concepts are reasonably expressed. Work may lack coherence and/or accuracy in places. Can work as part of a group, meeting most obligations to others but perhaps with limited involvement in group activities. Demonstrates the basic skills for employment requiring the exercise of some personal responsibility, with some areas of strength and some of minor weakness.	Mostly coherent, organised and accurate work, in a suitable structure and is for the most part clearly expressed. Can work effectively independently and/or as part of a team, with a clear contribution to group activities. Demonstrates very good skills for employment requiring the exercise of some personal responsibility, with just occasional minor weakness.	Work is accurate, coherent, fluent, well-structured and organised. Can work effectively independently and/or as part of a team, with very good contribution to group activities. Demonstrates very good skills for employment requiring the exercise of some personal responsibility, with just occasional minor weakness.	Work is coherent, very fluent and is presented professionally. Can work effectively independently and/or as part of a team, with an excellent contribution to group activities. Demonstrates excellent skills for employment requiring the exercise of some personal responsibility with an appetite for further development.	Work is accurate, exceptionally coherent, very fluent and presented well. Can work effectively independently and/or as part of a team, with an exceptional contribution to group activities. Demonstrates exceptional skills for employment requiring the exercise of some personal responsibility with an appetite for further development.

Level 4		FAIL	MARGINAL FAIL	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT	EXCEPTIONAL
Category		0-29%	30-39%	(3 rd / Pass) 40-49%	(2.2 / Pass) 50-59%	(2.1 / Merit) 60-69%	(1 st / Distinction) 70-84%	(1 st / Distinction) 85-100%
			exercise of some personal responsibility.	of minor weakness.				

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